THE IRON TRADE REVIEW

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Mill Orders Show Substantial Increases

And Lowest Prices on Pig Iron are Disappearing—Crude Steel Firmer—Contracting for Bars for Third Quarter

New orders received by the mills during the first three weeks of February indicate that the present month will exceed January in volume of business. Pig iron sales will show a much larger tonnage than that of January, although a considerable part of it was sold at very low figures. Improvement is not uniform throughout the market, but upon the whole is satisfactory.

Iron Ore

Arrangements have been completed for bringing to this country about 250,000 tons of Spanish ore, practically all representing new sales just closed. As negotiations for pig iron for delivery during the last part of the year become more general, there is more interest in the Lake Superior iron ore situation, but no steps have been taken which indicate what prices will prevail for this year's delivery.

Crude Steel

Following the announcement of last week of a sale of 2,000 tons of open-hearth sheet bars at an advance of $1 a ton, several companies withdrew all quotations on that product, and have refused offers of $24 Pittsburg for thousand-ton lots. Premiums of from 50 cents to one dollar a ton on forging billets have been paid in the Pittsburg market, and the crude steel market is considerably firmer than for a number of months.

Pig Iron

In eastern territory, particularly in New England, where extremely low prices have recently been made on iron shipped from New York state, especially Buffalo, low quotations are not now so general, and the tone of the market is stronger. In basic, a number of important sales have been made in the central west, including 15,000 tons to two steel foundries in St. Louis and a number of round tonnages in the Pittsburg district. While sales of basic have been made as low as $13.50 valley, the usual quotation is $14. Reports of very large tonnages of foundry grades being sold to harvester and cast iron pipe companies were exaggerated, but there is evidently a good deal of quiet buying by important consumers. A sale of 800 tons of southern No. 2 foundry was made at $11 Birmingham for second quarter, $11.25 for third quarter and $11.50 for the last quarter. This transaction seems to represent the market pretty accurately on the southern product. Many furnace companies are very slow to make quotations for last half delivery.

Bars

The leading interest has recently enjoyed a very heavy business in steel bars, and some contracts have been made covering the second quarter. There is heavy inquiry in steel bars pending, although in some centers low prices of bar iron are having a depressing effect on the steel bar market. Bar iron is stronger in the east and in Pittsburg, but some low prices have been made within a few days at Chicago and St. Louis.

Railroad Buying

The Chicago & Northwestern has placed an order for 40,000 tons of Bessemer steel rails with the Illinois Steel Co., which company has also received specifications from the Lake Shore lines west for 15,000 kegs of spikes, 5,000 kegs of track bolts, and 750 tons of angle bars. An independent interest has received an order for 6,500 kegs of spikes from the Lake Shore Railroad lines west, and the Nickel Plate railroad is in the market for 5,000 tons of steel rails, the specifications calling for 1 per cent titanium. The electric railroads have placed orders for 15,000 tons of girder rails at Chicago. Sales of rails for export include 15,000 tons for the Buenos Ayres and Pacific, and 10,000 tons are pending for Manila railroads. The New York, Westchester & Boston is closing with eastern mills this week for 5,500 tons. The Montreal street railways are inquiring for 1,400 tons. The St. Paul tonnage, 50,000 tons, is pending, as is also that for the Grand Trunk.

Scrap and Coke

The scrap market in the Pittsburg district is still very active, and it is estimated that 40,000 tons of heavy melting steel have been sold at an average price of $14.50, compared with $13, the price which prevailed a few weeks ago. In Philadelphia, some 10,000 tons of heavy steel have been sold, and prices are tending upward. The coke market is stronger, and operators in the Connellsville region are having trouble in getting sufficient labor.

WORLD'S IRON MARKETS

PITTSBURG

Advance in Wire Imminent—Crude Steel Market is Firm.

Office of THE IRON TRADE REVIEW,
510 Park Building, Feb. 21.

New business in finished materials is coming in at a more satisfactory rate than a month ago, and mill operations have been materially increased on account of the heavier specifications against contracts placed during the initial month of the year. Notwithstanding that February is a short month, the rate at which new business has been entered on order books during the first 20 days indicates that practically every steel company in the Pittsburg territory will make a better showing in February than last month. Some large contracts for steel bars have been placed during the week for delivery up to July 1 and heavy tonnage is involved in inquiries now pending. The tin plate market continues active and a slightly firmer tone is noted in the sheet market. Specifications against contracts for wire products are exceedingly heavy, and a meeting of wire manufacturers likely will be held this week, following which a new card probably will be issued. Bar iron is firmer and no sales have been reported below 1.40c, Pittsburg.

The semi-finished steel market is very firm. The demand for tin bars is normal. Following the announcement last week of a sale of 2,000 tons of open-hearth sheet bars at $25, Pittsburg, an advance of $1 a ton, some mills have practically withdrawn from the market. Some fairly heavy inquiries for billets and sheet bars for delivery over the next four months have appeared during the past week. Both Bessemer and open-hearth billets and sheet bars have been sold at $23 and $24, respectively, makers' mill, Pittsburg or Youngstown, although all mills are not quoting these prices.

Some large orders for pipe have been placed and heavy tonnage is under negotiation. The Riverside plant of the National Tube Co., consisting of two blast furnaces, a Bessemer steel plant, skelp mills and a complete pipe plant, will be started in full, the blast furnaces being started this week. Sales of prompt furnace coke have been made at slightly higher prices, due partly to a shortage of labor, following the starting of several thousand ovens by the H. C. Frick Coke Co.

Pig Iron.—Sales of round tonnages of basic pig iron for early delivery have been made in this market. One lot was sold to a steel company in the Pittsburg district, which has a 90-cent freight rate from the valley, on a basis of $13.50, valley. The iron, however, will not come from valley furnaces, although the seller in this case also has a 90-cent freight rate. In some quarters it is believed that this iron has been taken on an option secured some days ago, and it is doubtful if additional iron could be picked up at that figure. Another steel company with works along the Allegheny river has taken 3,000 tons of basic pig iron for delivery over the next three months, and while the buyer is understood to have paid $13.75, valley, for some of this iron, it is also known that this figure was shaded slightly on a portion of the iron. Scattered sales of basic have been made in this territory at $13.75, valley, although valley furnaces continue to ask $14. Firm offers of $13.50, valley, on round tonnages of basic during the past few days have not developed into sales. A sale of 1,000 tons of malleable and several smaller lots of this grade are noted at $13.75, valley, and the market is firm at that figure.

The foundry pig iron market is decidedly firmer and low quotations have been withdrawn. Practically all trading has been on a basis of $14 valley, but no sales have been reported at $13.75 valley, the price established last month. A few small lots of No. 2 foundry for second half have been sold at $14.25 valley. Demand for malleable and gray forge is light. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$15.00
Bessemer, Pittsburg	15.90
Basic, valley	13.75
Basic, Pittsburg	14.65
No. 2 foundry, Pittsburg	14.65
Gray forge, Pitsburg	14.15
Malleable, Pittsburg	14.65

(First Half.)

Bessemer, valley	$15.00
Bessemer, Pittsburg	15.90
Basic, valley	14.00
Basic, Pittsburg,	14.90
No. 2 foundry, Pittsburg	14.90
Gray forge, Pitsburg	14.15
Malleable, Pittsburg	14.65

Ferro-Alloys. — Aside from the inquiry for 300 tons of 50 per cent ferro-silicon, there have been no new developments in this market during the week. A few scattered lots have been sold at from $55 to $55.50, Pittsburg, for prompt and first half. Users of ferro-manganese are covered for early needs and the market is not very firm at from $37.50 to $38, Baltimore.

We quote ferro-manganese at $37.50 to $38, Baltimore, for prompt and first half of 1911. The freight rate from Baltimore to Pittsburg is $1.95 per ton.

Fifty per cent ferro-silicon is quoted at $55 to $55.50, Pittsburg, for prompt and first half; 12 per cent, $25; 11 per cent $24; 10 per cent, $23, f. o. b. Jisco and Ashland furnaces. The freight rate to Pittsburg is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates. — Miscellaneous business in plates is moderately heavy and bookings so far in February show a gain over the corresponding period in January. The Virginian Railway Co. has placed an order with the Pressed Steel Car Co., Pittsburg, for 1,000 70-ton steel hopper cars and the raw material will be furnished by the Carnegie Steel Co. The Wabash-Pittsburg Terminal Railroad Co. is expected to close Wednesday on its inquiry for 1,000 steel hopper cars. Large orders for cars are being held up, pending a decision by the interstate commerce commission regarding the proposed advance in freight rates. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.40c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including 3-16 inch plate on thin edge, 01.10c; under 3-16 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—Sheet mill operations have been increased somewhat during the

past week and actual bookings and specifications show a gain over the early part of the month. Prices are being maintained and it is likely that another meeting of manufacturers will be held in the near future, at which some of the independents are expected to bring up the question of a new card, which will provide for a slight advance in prices. Jobbers report a heavier demand for sheets and have requested slightly heavier shipments. The Allegheny Steel Co., Brackenridge, Pa., this week is operating 13 of its 18 sheet mills. We quote prices as follows, with $1 a ton added as the delivered price in the Pittsburg district:

Blue annealed sheets, No. 10 gage, 1.65c; box annealed sheets, No. 28 gage, 2.20c; galvanized sheets, No. 28 gage, 3.20c; painted roofing sheets, 1.55c per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, 2.75c per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—The announcement that the Jones & Laughlin Steel Co. has authorized the building of 12 additional tin mills at its Aliquippa, Pa., plant, giving the company a 24-mill plant at that place; the starting of additional mills by the leading interest and independents and requests from large consuming interests for heavier shipments against running contracts are among the encouraging features in this market. A conservative estimate places present mill operations at about 90 per cent of the available capacity of the leading interest and independents. The Pope Tin Plate Co., Steubenville, O., is operating its plant to capacity this week, several mills having been put in on Monday. A number of the larger plants in this territory are booked to capacity over the next five or six months and consumers are endeavoring to cover as far ahead as possible at today's prices. Another advance in the price of tin plate would not be unexpected, although reports that another advance will be made are not confirmed. The base price on tin plate is as follows:

Coke tin plate, 10-pound basis, 14 x 20, $3.70, f. o. b. mill, Pittsburg district.

Rails and Track Material.—A fair volume of miscellaneous business in both standard and light rails is reported in this market, although no particularly large awards have been made. Mill operations are slightly in excess of a month ago. Lumber interests and other users of light rails are buying more freely and some fairly large orders are being negotiated. Orders for spikes and track bolts are moderately heavy, although buying in most cases is confined to early needs. We quote the market as follows, the base price on open-hearth rails being 1.34c per pound at the mill:

Fifty-pound and heavier, 1,25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight off 40 to 45 pounds, $26.50 to $27, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburg; track bolts, 2.30c, Pittsburg; railroad spikes, 1.55c, Pittsburg.

Steel.—Following the announcement last week of a sale of 2,000 tons of open-hearth sheet bars at $25, Pittsburg, an advance of $1 a ton, the leading interest and two or three independents have withdrawn all quotations on open-hearth sheet bars, and have refused offers of $24, Pittsburg, for 1,000-ton lots. Premiums of from 50 cents to $1 a ton in the price of forging billets have been paid in this market during the week, and the market is now quotable at from $28 to $28.50, Pittsburg. Most consumers of forging billets are covered by contract and recent trading has been for small lots. The crude steel market as a whole is much firmer than for several months, and while several mills have withdrawn from the open-hearth steel bar market, scattered sales have been made by some mills at $24, Pittsburg. Practically all of the serviceable open-hearth steel mills in this territory are operating to capacity, and several entirely new furnaces, including those of the Jones & Laughlin Steel Co., at Aliquippa, and the Republic Iron & Steel Co., at Youngstown, O., will be ready for service within the next few months. Bessemer billets and sheet bars are still very firm at $23 and $24, respectively, makers' mills, Pittsburg or Youngstown, O.

We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $23, with the usual extras for size and analysis, and open-hearth rolling billets, $23. Bssemer sheet and tin bars are quoted at $24, and open-hearth sheet bars are quoted at $24, makers' mill, Pittsburg or Youngstown, with full freight to destination added. Forging billets are quoted at $28 to $28.50, Pittsburg.

Hoops and Bands.—New business in hoops and bands is only moderately heavy, although specifications show a slight gain over the preceding week. Most mills are asking 1.50c, Pittsburg, for hoops in carload lots, although this price is understood to have been shaded slightly on particularly desirable business. We quote the market as follows:

Hoops in carload lots, 1.45c to 1.50c; in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Merchant Bars.—This market is making a better showing than for several months in point of new business and specifications. Some large contracts for steel bars have been placed in this market during the week for delivery prior to July 1, and a number of inquiries involving heavy tonnage for delivery over the next six months are pending. Prices are firm and the mills are not quoting today's prices for delivery beyond the six months. The bar iron market is firmer and low quotations in some sections of the country have entirely disappeared. The bulk of the trading during the week in this market has been done at 1.40c, Pittsburg, and no sales have been reported at 1.35c, Pittsburg. Demand for shafting is moderately heavy and some fair sized orders have been booked. We quote the market as follows:

Common iron bars, 1.40c, Pittsburg; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3-inch, 1.50c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 55 per cent in carloads and 50 per cent in less than carloads, delivered in base territory.

Muck Bar.—Higher prices are being quoted on muck bar and it is doubtful whether $30, Pittsburg, could be shaded on the best grades of this material. The muck bar plant of the Kittanning Iron & Steel Co., Kittanning, Pa., which has been idle for some time, resumed operations this week. In the absence of any sales, we quote the market at $30, Pittsburg.

Structural Material.—No particularly large awards have been made in this market, although fabricators and steel companies report a fair volume of miscellaneous business. The Hammermill Paper Co., Erie, Pa., has awarded a contract to the Pittsburg Bridge & Iron Works, Rochester, Pa., for its new buildings, which will require about 600 tons of steel. Bids have gone in on some new work in the immediate Pittsburg territory, which will involve a fairly heavy tonnage of structural steel and some awards are expected within the next few weeks. We quote the market as follows:

Beams and channels, 15 inches and under, 1.40c; over 15 inches, 1.50c; zees, 1.40c; tees, 1.45c; angles, from 3 to 6 inches, 1.40c; over 6 inches, 1.50c; universal and sheared plates, 6¼ inches wide and wider, 1.40c.

Merchant Pipe.—As a result of the increased buying of pipe during the past several weeks, mill operations have been increased materially and other plants will be started shortly. A large order for steel pipe, which has been pending for some time, is understood to have been placed, although details are lacking. The Riverside plant of the National Tube Co., which has

been idle for some time, is expected to be in full operation within the next few weeks. Furnace C was started Monday and furnace A will be blown in Thursday. The steel department, the blooming mills and skelp mills will be started Mar. 6 and the tube department Mar. 7. Inquiries involving heavy tonnage of steel pipe to be used in new pipe lines in the west are pending and some fairly large awards are anticipated in the near future. We quote the following official discounts in carload lots, subject to the usual preferential discount to the larger buyers, merchant pipe, where specified, being offered in from ⅛ to 6 inches:

Iron and Steel Basing Prices.

	Steel.		Iron.	
		Butt weld.		
	Black.	Galv.	Black.	Galv.
⅛, ¼, ⅜ inch.....	72	58	68	54
½ inch	75	63	71	59
¾ to 1½ inch	79	69	75	65
2 to 3 inches.....	80	70	76	66
		Lap weld.		
2 inches	76	66	72	62
2½ to 4 inches.....	78	68	74	64
4½ to 6 inches.....	77	67	73	63
7 to 12 inches.....	75	59	71	55
EXTRA STRONG, PLAIN ENDS.				
		Butt weld.		
⅛, ¼, ⅜ inch	69	59	65	55
½ inch	74	68	70	64
¾ to 1½ inch	78	72	74	68
2 to 3 inches	79	73	75	69
EXTRA STRONG, PLAIN ENDS.				
		Lap weld.		
2 inches	75	69	71	65
2½ to 4 inches.....	77	71	73	67
4½ to 6 inches.....	76	70	72	66
7 to 8 inches.....	69	59	65	55
9 to 12 inches.....	64	54	60	50
DOUBLE EXTRA STRONG, PLAIN ENDS.				
		Butt weld.		
½ inch	64	58	60	54
¾ to 1½ inch	67	61	63	57
2 to 3 inches.....	69	63	65	59
DOUBLE EXTRA STRONG, PLAIN ENDS.				
		Lap weld.		
2 inches	65	59	61	55
2½ to 4 inches.....	67	61	63	57
4½ to 6 inches.....	66	60	62	56
7 to 8 inches.....	59	49	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

Boiler Tubes.—This market continues fairly active, although new business in locomotive boiler tubes is not very heavy on account of the light buying of locomotives. Some fairly large orders for merchant boiler tubes have been placed. We quote the market as follows:

	Steel.	Iron.
1 to 1½ inch.....	49	43
1¾ to 2¼ inch.....	61	43
2½ inch	63	48
2½ to 5 inch.....	69	55
6 to 13 inch	60	43

2½ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destination east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

Wire Products.—Specifications against contracts for wire and wire nails are exceedingly heavy and local mills are running to greater capacity than for months. It is understood that a meeting of wire manufacturers will be held this week, at which the question of advancing prices will be acted upon. It is generally conceded that there will be another advance of about $1 a ton on all wire products and in some quarters it is believed that a new card will become effective before Mar. 1. The last advance of $1 a ton was made Jan. 20, 1911. Demand for cut nails is moderately heavy, although there has been no change in the market price. We quote the market as follows:

Wire nails, jobbers' carload lots, $1.75; retailers' carload lots, $1.80, cut nails, jobbers' carload lots, $1.65 to $1.70; painted barb wire, jobbers' carload lots, $1.75, retailers' carload lots, $1.80, with 30c for galvanizing; plain wire to jobbers in carloads, $1.55, and to dealers, in carloads; $1.60, polished staples, $1.75; galvanized staples, $2.05.

Wire Rods.—More general buying of wire rods in small lots for early shipment is noted and the market has been pretty well established at $29, Pittsburg. The new rod mill of the Cambria Steel Co., at Johnstown, Pa., which was started last week, is working on some fairly large orders. We quote $29, Pittsburg, on Bessemer and open-hearth rods.

Coke.—The coke market is much firmer, and sales of prompt furnace coke have been made during the week at somewhat higher prices. The high prices are due partly to the fact that there is a shortage of labor in the Connellsville coke region. Several months ago, when many of the ovens of the Connellsville region were closed down, a large number of workmen went to the Irwin, Pa., coal field. The H. C. Frick Coke Co. during the past few days has started several thousand coke ovens, and as a result, there are few idle workmen in the Connellsville region. Sales of prompt furnace coke have been made during the week at $1.55 ovens, while in a few instances, $1.60 ovens has been paid for some grades. Consumers who have been buying in the open market from month to month, are anxious to cover for the next several months, but there has been little actual trading for forward delivery. We quote standard Connellsville furnace coke for prompt shipment at from $1.45 to $1.50 ovens, and for first half $1.60 ovens. High grade Connellsville foundry coke we quote at from $1.95 to $2 ovens. The Connellsville *Courier's* figures for the week ending Feb. 11 show 25,873 active ovens, or an output of 323,333 tons, as compared with 24,741 active ovens, with a production of 302,275 tons the previous week.

Old Material.—It is estimated that the sales of heavy melting steel grades in the Pittsburg territory during the past week will aggregate 40,000 tons. As a result, the market on heavy melting scrap is very firm at from $14.50 to $15, an advance of $1.50 a ton since January. Rerolling rails are 25 cents a ton higher, and a like advance is noted in the price of old car wheels. Stove plate has been advanced 50 cents. A steel company east of Pittsburg, which bought approximately 18,000 tons of heavy melting steel and bundled sheet scrap around the first of the month, has been a heavy buyer in the past week. Considerable tonnage has been taken by a steel company with works along the Monongahela river. We quote gross tons delivered in the Pittsburg district, including Monessen, Sharon, Steubenville, Brackenridge and Follansbee as follows:

Heavy melting scrap	$14.50 to 15.00
Rerolling rails	15.00 to 15.50
Bundled sheet scrap	11.75 to 12.25
Iron axles	24.00 to 24.50
Old iron rails	15.00 to 15.25
No. 1 wrought scrap	13.50 to 14.00
Old car wheels	13.75 to 14.25
Low phosphorus	17.00 to 18.00
Machine shop turnings	10.25 to 10.75
Cast borings	9.25 to 9.75
No. 1 cast scrap	14.00 to 14.50
Malleable	13.00 to 13.50
Stove plate	11.00 to 11.50

CHICAGO

Pig Iron Makes Good Showing—Finished Lines Not so Active.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Feb. 21.

Pig iron sales continue to hold up very well, but there is a slight lull in the activity in finished lines, particularly in the lighter products, including sheets and wire. Orders for standard rails are somewhat light, but street railway interests in the west have made rather extensive purchases during the past week. The warehouses report an active business, particularly in steel bars. In spite of the heavy structural awards, which have been made during the past three weeks, competition between fabricators is still pretty keen and prices are showing no buoyancy.

The announcement of the interstate commerce commission's decision regarding the railway freight rate controversy and important decisions effecting corporations by the Supreme Court are expected shortly, and in some quarters business is a little hesitant, awaiting advices regarding these matters.

Pig Iron.—Interest in the pig iron market has shifted to basic and two large steel foundry interests, having plants at East St. Louis, have purchased for second and third quarter. One firm bought 5,000 and the other

10,000 tons. Details regarding the prices have not leaked out, but it is understood on good authority that one lot was obtained for $16.50, St. Louis, for second quarter delivery. Inquiry for foundry iron is somewhat light at present. Most foundries are completely covered for their first quarter requirements, but there is still considerable second quarter tonnage to be placed. Buyers, however, are anxious to obtain quotations on third and fourth quarter delivery and when they are able to do so, are willing to make contracts. We note the purchase of 800 tons of Southern No. 2 by an Illinois manufacturer for delivery during the balance of the year at the following prices, $11.00, Birmingham, for second quarter delivery; $11.25, Birmingham, for third quarter, and $11.50 for fourth quarter. This transaction is a representative one and indicates what can be done in southern iron for the remainder of the year. A Quincy, Ill., foundry is in the market for 3,000 tons of southern iron. Sales of charcoal iron are fair, but the market has not stiffened to any extent. Local furnaces are still offering northern foundry No. 2 at $15.50, Chicago, and this would probably be shaded on round lots. Low grade iron has been pretty thoroughly bought up in this territory and prices on No. 3 and 4 foundry irons are stiffening somewhat as a consequence.

We quote the market, f. o. b. Chicago, as follows:

(Prompt shipment and first half.)

Lake Superior charcoal	$17.50
Northern foundry No. 2	15.50
Southern foundry No. 2	15.35
Southern silveries, 5 per cent silicon	16.35
Jackson Co. silveries 8 per cent	19.40
Malleable Bessemer	15.50
Alabama basic	15.35

Billets.—We note an inquiry for 500 tons of open-hearth forging billets. Orders in the local market are still light and the market is quotable nominally $28.00, f. o. b. Chicago, for open-hearth forging billets.

Merchant Bars. — Orders for iron bars are being received in fairly satisfactory quantities. The leading mill rolled more iron during the first 17 days in February than it did during any entire month for six months previously. Mill specifications for steel bars are fairly heavy, but new contracts are scarce. There is an active trade in steel bars out of stock. Hard steel bars, re-rolled, are quiet, the price remaining 1.35c to 1.40c, Chicago. Local re-rolling mills are operating at about 75 per cent capacity.

We quote, Chicago delivery, as follows:

Bar iron, 1.30c to 1.35c; hard steel bars, re-rolled, 1.35c to 1.40c; soft steel bars and bands and small shapes, 1.58c to 1.63c, base; hoops, 1.68c to 1.73c; planished or smooth finished tire steel, 1.78c to 1.83c, base; iron finished tire steel, 1.73c, base; smooth finished machinery steel, 1 inch and larger, 1.98c; spring steel, 2.28c; crucible spring steel, 2.78c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 57 per cent off the list for carload lots, and 52 per cent off for less than carload lots, carload freight allowed to points in base territory.

On iron and steel from local stock, we quote as follows:

Bar iron, 1.80c to 1.90c. per pound base; soft steel bars, 1.80c to 1.90c per pound base; soft steel hoops, 2.10c to 2.20c, full extras.

Structural Material.—In spite of the heavy fabricating contracts which have been let recently, structural shops are still eager for business, and competition is keen. Fabricating prices show little improvement. The McClintic-Marshall Construction Co. will fabricate the new foundry building, 800 tons, at the Puget Sound Navy Yard, Bremerton, Wash. A contract for the post office at Missoula, Mont., 116 tons, has been let to the St. Paul Foundry Co. The First Presbyterian Church, San Francisco, 140 tons, will be fabricated by the Pacific Rolling Mill Co. and the St. Ignatius Church for the Jesuit Fathers, also at San Francisco, 800 tons has been let to the Central Iron Works of San Francisco. The West Side Y. M. C. A. building, Chicago, 270 tons, has been taken by A. Bolters' Sons. A wagon factory to be erected by the Anheuser-Busch Brewing Assn., St. Louis, 570 tons, will be fabricated by Noelke-Richards Iron Works, Indianapolis. Heyl & Patterson, Pittsburg, have taken a contract for a coal-handling plant, 440 tons, for the C. Reiss Coal Co. at Manitowoc, Wis. The total involved in fabricating contracts reported in this market last week was 3,796 tons.

We quote, mill prices for structural shapes, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.58c to 1.63c. For extras, see Pittsburg report.

On structural material from store, we quote, Chicago delivery, as follows:

All angles, 3 inches and larger, including 6 inches, $1.80 to $1.90 per 100 pounds; angles over 6 inches, $1.90 to $2 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.80 per 100 pounds, base; channels, 3 inches and larger, $1.80 per 100 pounds, base.

Rails and Track Supplies.—The Bessemer rail mill at the South Chicago plant of the Illinois Steel Co. commenced operating today. The Gary mill has been in operation for some little time. Western railroads are still holding back orders for their 1911 requirements and the bookings of standard rails last week were comparatively light. Electric railway interests, however, bought 15,000 tons of girder rails. Some fair sized negotiations are under way with western roads at present, including 50,000 tons for the Chicago, Milwaukee & St. Paul, but no business has been closed yet. Track supply orders are good.

See Pittsburg report for prices on Standard sections.

We quote, light rails and track supplies, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.65c to 1.75c; smaller size spikes, 1.70c, base; track bolts with square nuts, 2.15c to 2.25c, base.

Plates.—The Burlington has temporarily withdrawn its inquiry for 500 refrigerator cars and the inquiry of the American Refrigerator Transit Co. for 1,500 refrigerator cars is still pending. Specifications for plates received at local mills during the past week were fair. New business in plates at present is just a little slow.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.58c to 1.63c. For extras, see Pittsburg report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.80c to 1.90c; from 72 inches to 96 inches wide, 1.90c to 2c; 3-16 inch up to and including 60 inches wide, 1.90c to 2c; 72 inches, 2.15c to 2.25c; No. 8, up to 60 inches wide, 1.95c to 2.05c. Flange quality and heads, 25c extra.

Sheets.—Mill business in sheets is holding its own, and buying out of stock is brisk. The local mill is operating at from 50 to 60 per cent of its capacity. Prices are well maintained. Sheet mills, however, are still anxious for business and will accept tonnages which ordinarily should be turned over to warehouse interests.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed No. 10, 2.10c to 2.20c; No. 12, 2.15c to 2.25c. Box annealed, No. 28, 2.75c to 2.85c. Galvanized, No. 28, 3.65c to 3.75c.

For mill prices, see Pittsburg report. Freight to Chicago, 18 cents.

Wire Products.—Orders for wire are smaller but shipments remain very heavy. A little lull in new business was expected as soon as the rush following the recent advance in prices was over. Prospects for a good spring trade in wire products are very good, however, and if all branches of the steel business were in as good condition, the industry would be booming.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.93; retailers' carload lots, $1.98; retailers' less than carload lots, $2.08; painted barb wire, jobber's carload lots, $1.93; retailers' carload lots, $1.98; retailers', less than carload lots, $2.08; with 30c for galvanizing; plain wire to jobbers, $1.73; plain wire, retailers' carload lots, $1.78; staples, bright, $1.93.

Merchant Pipe and Tubes.—February orders, particularly out of store, are holding up very well. Rumors of a change in the price of merchant pipe are denied, and it is not probable that there will be any price changes in tubular goods for some time. Sales of boiler tubes out of store are very satisfactory, although most of the orders are for small tonnages.

We quote, iron and steel pipe and tubes, out of store, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Price.

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛-¾ inch	69.2	54.2	63.2	48.2
⅛ inch	72.2	59.2	66.2	53.2
2 in. to 3 in.	77.2	66.2	72.2	61.2
4½-6 inches	74.2	63.2	69.2	58.2
7-12 inches	71.2	54.2	67.2	50.2
EXTRA STRONG, PLAIN ENDS.				
¼ inch	70.2	63.2	64.2	52.2
2-3 inches	75.2	68.2	61.2	55.2
7-8 inches	65.2	....	59.2	47.2
DOUBLE EXTRA STRONG.				
¼ inch	58.2	50.2	....	....
2-3 inches	63.2	55.2	....	....
7-8 inches	53.2	41.2	....	....

Tubes.

	Lap weld steel. Per cent.	Charcoal iron. Per cent.	Shelby seamless. Per cent.
1 inch	38	..	57½
1¾ to 2¼ inch	52	38	35
2¾ to 5 inch	62	50	46

Cast Iron Pipe.—Pipe shipments continue heavy and routine new orders are good. Most of the shading which has been noticeable in the west during the past month has disappeared and prices at present are fairly uniform. The leading interest has announced an advance of about 50 cents a ton.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $25; 6 to 12 inches, $24.50, larger sizes, $23.75; gas pipe, $1 a ton higher.

Old Material.—The local scrap market remains very firm and higher prices are noted in several lines. Old iron rails, heavy melting steel and iron car axles have advanced 50 cents a ton and a number of other items show increases averaging about 25 cents a ton. The Chicago, Milwaukee & St. Paul offers a list amounting to 1,450 tons, on which bids will close Friday, Feb. 24. The principal items in this list are 500 tons of old steel rails, 200 tons of No. 1 railroad wrought and 175 tons of frogs, switches and guards. Dealers are buying freely all the scrap that is offered and competition between dealers in some cases is bidding the market up. Consumers, however, are still holding off buying only for their absolute minimum requirements, feeling that present price levels are not justified by market conditions.

We quote the market, for delivery in consumers' yards, Chicago, as follows:

GROSS TONS.	
Old car wheels	$12.25 to 12.75
Old iron rails	15.00 to 15.50
Rerolling rails (5 ft and over)	13.50 to 14.00
Old steel rails (3 ft. and under)	12.50 to 13.00
Frogs, switches and guards	12.00 to 12.50
Heavy melting steel	12.00 to 12.50
Shoveling steel	11.50 to 12.00
NET TONS.	
No. 1 R. R. wrought	$12.00 to 12.50
No. 2 R. R. wrought	11.00 to 11.50
Arch bars and transoms	14.50 to 15.00
Knuckles, couplers and springs	11.75 to 12.25
Shafting	15.75 to 16.25
Iron car axles	18.75 to 19.25
Steel car axles	17.75 to 18.25
Locomotive tires	16.50 to 17.00
Dealers' forge	10.50 to 11.00
Pipes and flues	9.00 to 9.50
No. 1 cast, 150 lbs. and less	12.25 to 12.75
No. 1 busheling	9.75 to 10.00
No. 2 busheling	8.50 to 9.00
No. 1 boiler cut	8.75 to 9.25
Boiler punchings	14.25 to 14.75
Cast and mixed borings	6.00 to 6.50
Machine shop turnings	7.00 to 7.50
Railroad malleable	10.75 to 11.25
Agricultural malleable	10.25 to 10.75
Stove plate and light cast scrap	10.25 to 10.75
Angle bars, splices, etc., iron	13.25 to 13.75
Angle bars, steel	11.25 to 11.75

CLEVELAND

More Interest in Last Half Pig Iron—Contracts for Bars.

Office of THE IRON TRADE REVIEW,
Penton Building, Feb. 21.

Iron Ore.—As the placing of orders for pig iron to be delivered during the last half of the year is now beginning, it seems inevitable that the pressure from the furnace operators upon the ore sellers to fix ore prices will become stronger, but there is nothing yet upon which to predicate any definite statement as to what will be the ore prices.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $5; Mesabi Bessemer, $4.75; old range non-Bessemer, $4.20; Mesabi non-Bessemer, $4.

Pig Iron.—There has been considerable sparring between buyers and sellers in regard to business for the last half of the year, and furnace interests are rather slow to quote. When they do so, they usually name a price that does not attract buyers, but some sales have been made at $14.75 northern Ohio furnace for last half. For the most part, however, lake furnaces are not anxious for the tonnage at less than $15. The appearance in the market of a seller which usually uses its own basic in its open-hearth furnace has introduced a rather uncertain factor, and to this seller are attributed some recent sales at rather low prices, including one to a Canton, O., interest. A fair number of inquiries have been received during the past few days, and the tone of the market is stronger.

Increased activity of railroads is indicated by new specifications and orders received within a few days. The Illinois Steel Co. has received specifications from the Lake Shore lines west for 15,000 kegs of spikes, 5,000 kegs of track bolts and 750 tons of angle bars. An independent interest has received an order for 6,500 kegs of spikes from the Lake Shore lines west, and has sold 4,100 kegs of nails to another interest. The Nickel Plate railroad is in the market for 5,000 tons of steel rails and the Pennsylvania for 2,000 tons of structural material for dock construction. The demand for bright wire and shafting has improved.

We quote delivered in Cleveland for the remainder of the first half of the year as follows:

No. 1 foundry	$14.50 to 14.75
No. 2 foundry	14.00 to 14.25
No. 2 Southern	15.35
Gray forge	13.50 to 14.00
Bessemer	15.90
Lake Superior charcoal	17.50
Jackson Co. 8 per cent silvery	19.00

Coke.—The coke market is not active, but prices are firm with a tendency downward.

Connellsville furnace coke, $1.55 for prompt delivery, and $1.60 for first half. Connellsville foundry coke, $1.95 to $2 for prompt, and $2 to $2.50 for first half.

Finished Material. — Buyers are showing more anxiety to contract and some contracts for steel bars have been made through the second quarter, but mills are acting very cautiously in committing themselves longer than three months. This is particularly true of structural material.

Old Material.—The increased demand for heavy steel noted last week continues and has been reinforced by further demand for stove plate. The demand for both grades of material is heavier from outside the city. Shipments of stove plate to the amount of 300 tons have been made to Detroit and other nearby points are asking for various quantities. Country roads are not in good condition, thus preventing accumulations of cast scrap and stove plate, hence the apparent scarcity. Cast drillings are becoming scarcer because of demand extending even to Pittsburg territory, and wrought drillings are now being bought instead. One contract has been made for the entire output of heavy steel scrap from a down-state

steel plant at $14.50, mill, the contract running for some months. We quote, gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (under 6 ft.)	13.75 to 14.25
Old car wheels	13.50 to 14.00
Old steel boiler plate	11.50 to 12.00
Malleable iron (railroad)	13.25 to 13.75
Steel axles	19.00 to 19.50
Malleable iron (agricultural)	12.00 to 12.50
Heavy steel	13.50 to 14.00
Country mixed steel	11.50 to 12.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$13.50 to 14.00
No. 1 busheling	11.50 to 12.00
No. 1 machine cast	12.50 to 13.00
Axle turnings	9.00 to 10.00
Machine shop turnings	8 50 to 9.00
Cast borings	7.50 to 8.00
Pipes and flues	9.00 to 9.50
Tank iron	8.50 to 9.00
Sheet iron	4.00 to 4.50
Wrought drillings	8.50 to 9.00
Cast borings	7.50 to 8.00
Wrought drillings	7.50 to 8.00

CINCINNATI

Good Inquiry and Fair Sales—Better Sentiment Prevails.

Office of THE IRON TRADE REVIEW,
808 Provident Bank Bldg., Feb. 21.

Pig Iron.—A better sentiment is gradually developing and the transactions of the week indicate a fair tonnage of various grades were sold. Reports from contiguous territory show a decided improvement in basic demand, with steel-making irons more active and the finished market growing stronger. Inquiries aggregating from 6,000 to 7,000 tons are reported for this territory, ranging from lots of 500 tons to 2,000. Sales in the main have been in small blocks, yet have totaled a fairly satisfactory tonnage for the week. There has been quite a heavy movement in high silicon grades, 8 per cent being quotable at $16.50, Jackson county furnace. It is evident, however, that the usual differential that exists between the grades is not being maintained on these irons, and prices are somewhat unsettled. Consumers are exhibiting considerable interest in third and fourth quarter business, and the bulk of the inquiry that is received appears to be for this delivery. As a rule, however, furnace interests are not anxious to sell beyond second quarter, although it is probable that considerable tonnage has been taken by some interests beyond this period. Prices for southern foundry grades to all appearances are holding firmly on an $11, Birmingham, basis, although there are rumors that some prompt business has gone as low as $10.75. Northern prices are said to be holding well at $14, Ironton. with probably some shading on desirable prompt business. Local foundries are only fairly busy, but are expecting renewed activity during the next two or three months.

A local melter is in the market for 500 tons of 6 per cent silicon and 100 tons of high manganese, delivery running through June. A Michigan concern is inquiring for 150 tons high phosphorus, 150 tons 8 per cent silicon, 200 tons 4 to 5 per cent silicon, 675 tons of northern foundry and 450 tons of malleable, all for second and third quarter delivery. A large consumer in Illinois territory wants 2,700 tons of southern No. 2 and No. 3 and 200 tons silicon, March to September delivery. Sales of charcoal and special irons in Pittsburg territory have been good and somewhat above the average during the week. A southern Ohio manufacturer bought 100 tons of southern No. 3 foundry for prompt shipment at regular quotations. The local melter that was reported last week as still in the market bought approximately 1,000 tons of various foundry grades. One of the large melters in southern Ohio today closed for an indefinite tonnage. We quote prices based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, f. o. b. Cincinnati, as follows:

Southern foundry No. 2	$14.25	$14.75
Southern foundry No. 3	13.75	14.25
Southern foundry No. 4	13.25	13.50
Southern gray forge	13.00	13.25
Mottled	12.75	13.00
Southern No. 1 soft	14.75	15.25
Southern No. 2 soft	14.25	14.75
Stardard Southern car wheel	25 25	25.75
Northern No. 2 foundry	15.20	15.45
Northern No. 3 foundry	14.70	14.95
Northern No. 4 foundry	14.20	14.45
Jackson county 8 per cent silicon	17.70 to 18.20	

Coke.—Aside from the general run of small trade, there is little pending of consequence. Consumers, as a rule, are covered until later in the year and little contracting is expected for the early future. Prices are a little soft and the market is quiet and featureless. We quote prices from the various coke districts as follows:

	Prompt Shipment.	Contract to July 1.
Connellsville district:		
Foundry coke	$2.00 to 2.25	$2.25 to 2 50
Furnace coke	1.60 to 1.70	1.65 to 1.75
Wise county district:		
Foundry coke	2.00 to 2.10	2.00 to 2.10
Furnace coke	1.75	*Sliding [scale basis.
Pocahontas district:		
Foundry coke	2.00 to 2.10	2.10 to 2.25
New river:		
Foundry coke	2.50 to 3.25	2.60 to 3.25
Furnace coke	2.00 to 2.15	2.10 to 2.20

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16 2-3 per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Plates, shapes and bars are holding firm at 1.40c, Pittsburg. Conditions are more satisfactory and the market is strong and trade more active. Local conditions are unchanged, so far as structural is concerned and no specifications of any consequence are pending. A contract was closed at Louisville during the week for about 3,000 tons to be used for a viaduct connecting the L. & N. and C. & O. railroads.

Old Material.—The market is quiet and demand for scrap is light. Dealers are slightly more optimistic than they were, and expect increased demand for their stock within a short time. Offerings have held to about normal during the week, and dealers' yards show little accumulation. We quote dealers' prices as follows:

GROSS TONS.

Old iron rails, gross	$14.50 to 15 00
Old steel rerol ing, gross	13.00 to 13.50
Old iron axles, gross	17.75 to 18.25
Steel melting scrap, gross	11.00 to 11.75
Car wheels, gross	11.00 to 11.50

NET TONS.

Old No. 1 R. R. wrought	$11.00 to 12.00
No. 1 machinery	11.00 to 13.00
No. 1 busheling	10.00 to 10.50
Stove plate	8.00 to 8.50
Heavy turnings	6.50 to 7.00
Cast borings	4.50 to 5.00
Grate bars	8.00 to 9.00
Sheet scrap, bushled	8.50 to 9.00
No. 1 cast scrap	10.50 to 12.00

NEW YORK

Stronger Tone Exists and Low Prices of Pig Iron Disappearing.

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., Feb. 21.

A better and stronger tone continues to be noted in all quarters in the pig iron market. Buyers more freely take up their forward needs and a heavy tonnage is being negotiated, considerable of which is being done quietly. Some leading consumers have entered the market and one New Jersey machinery manufacturer has closed for 10,000 tons of foundry grades for second and third quarter at about $15.50 delivered. A locomotive builder has taken 2,000 tons for an up-state plant. A Connecticut foundry has taken 2,000 tons. Two New Jersey buyers are out for 1,000 tons each. One thousand tons low phosphorus is pending for eastern Pennsylvania. Sellers are becoming more independent on prices with renewed interest of consumers and are withdrawing their lowest quotations, but the situation still shows some sales at attractive figures to buyers. Reports from Buffalo, where heavy tonnage has been sold recently at very low prices, are more favorable. Some low prices have been withdrawn and some sellers have not been able to buy within 50 cents of quotations made a week ago; $13.25 furnace seems to be the minimum there now and this is disappearing. The

New York Steel Co.'s furnace at Buffalo will blow in soon.

Northern foundry No. 1	$15.75 to 16.00
No. 2X foundry	15.25 to 15.75
No. 2 plain	14.75 to 15.25
No. 2 Virginia	15.30 to 15.80
No. 2 Southern foundry	15.25 to 15.75
Malleable	15.75 to 16.25
Gray forge	14.25 to 14.50

Iron Ore.—Announcement is made that arrangements have been completed for bringing in to eastern blast furnaces this year about 250,000 tons of Spanish ore, practically all of which represents new sales just closed. These sales have been made for first half delivery upon the same basis as that which prevailed upon the sales of this ore in July, 1909, or about 7½ cents per unit, f. o. b. cars at Philadelphia. Sellers are asking 8 cents per unit for shipment after July, but the prices made for such delivery in the contracts just closed may be mutually reconsidered if present lake ore prices are reduced. Deferred Spanish ore shipments on last year's contracts will be completed in March. The ocean freight market shows little activity on ore. One small cargo now afloat from Marbella, Spain, to Philadelphia, has been taken at 10s 9d. The market on good sized cargoes is indefinite, but apparently is about 10s.

Ferro-Alloys.—Small lots continue to represent the going business in ferro-alloys. Large buyers of ferro-manganese are showing little interest and as a consequence of the absence of tonnage business, the few lots of low-priced material pressing the market are more conspicuous. It is believed by some sellers that any sizeable inquiry would stiffen the market. Some little inquiry for 50 per cent ferro-silicon is coming out. It is reported in the market that the United States Steel Corporation was able to obtain a price of about $54, Pittsburg, on some of the large blocks of foreign material recently purchased. We quote 80 per cent ferro-manganese at from $37.50 to $38, Baltimore, for prompt and forward shipment, respectively. We quote 50 per cent ferro-silicon at from $54.50 to $55, Pittsburg.

Cast Iron Pipe.—Some increase of tonnage lately booked by makers has given the market a slightly better undertone, but prices are still very low. A good volume of private contracts is coming out and public lettings are better in the east. The leading interest has booked 1,300 tons for export to Havana, Cuba. The Albany and Pittsfield, Mass., lettings of 500 tons each are still pending. Bids will be taken March 1 on about 300 tons of 48-inch for New York City, and a large tonnage of this size is expected to come out soon for Brooklyn. We quote 6-inch pipe at from $21.50 to $22, f. o. b. New York, in carload lots.

Finished Materials.—Very satisfactory bookings in practically all finished lines continue and the rate at which business is entered by the leading steel makers this month will in all probability exceed the daily average tonnage in January. The volume of export trade continues. The Standard Oil Co. has closed for a considerable tonnage of tin plate for its Mexican plant. For China 1,500 tons of bridge work has been taken. The Lorain Steel Co. has booked 1,000 tons of frogs and switches for the South Manchurian Railway.

The McClintic - Marshall Construction Co. has taken contracts for warehouses at Newark, N. J., 500 tons, and an office building at Youngstown, for the Republic Iron & Steel Co., 600 tons, and shops of the New York, Ontario & Western, Middletown, N. Y., 400 tons. The Eastern Steel Co. has 300 for the Reading coal pocket, St. Clair, Pa. Ravitch Bros. are reported to have 1,200 for the Fischel building, this city. Additions to the Stetson building, Philadelphia, 550 tons, go to the McClintic-Marshall Construction Co. F. T. Nesbit has the general contract on the Woodward building, Washington, 1,000 tons. Bids have gone in on 3,000 tons for New Orleans pier sheds and 800 for a Jersey Central pier shed, Jersey City. The Banberger store, Newark, 4,000 to 5,000 tons, is asking preliminary bids. The award on the Delaware & Hudson shops, 4,000 tons, is expected this week.

Old Material.—Eastern Pennsylvania steel makers are closing more freely on round lots of heavy melting steel and as the result of this renewed interest in a sizable way after a long period of comparatively small trading, this grade has materially stiffened in price. Some sales at $14, delivered eastern Pennsylvania, have been made and $14.50, delivered, is reported. The sale of one lot of 4,000 tons and another of 1,500 tons to eastern mills is noted. In sympathy with heavy steel, rolling mill material shows a better tone, though the mills are still closing meagerly. Turnings and borings are also stronger and sales of old car wheels at $14.50, delivered, are noted. We quote, gross tons, New York dealers will pay at tidewater, with the exception of cast scrap which has a local demand as follows:

Old car wheels	$12.00 to 12.50
Old iron axles	22.50 to 23.00
Old steel shafting	16.00 to 16.50
Heavy melting steel	11.00 to 11.50
No. 1 R. R. wrought	12.50 to 13.00
Iron track scrap	11.50 to 12.00
Wrought pipe	10.00 to 10.50
Cast borings	6.00 to 6.50
Wrought turnings	6.00 to 6.50
Heavy cast scrap	12.00 to 12.50
Railroad, malleable	12.00 to 12.50
Stove plate	9.00 to 9.50
Grate bars	9.00 to 9.50

Recent Very Low Pig Iron Prices Not Now So Generally Made.

Feb. 20.

Pig Iron.—Makers are more encouraged with the better tone displayed by the market on all sides and are disposed to move more slowly in the booking of forward tonnage. Minimum prices as a consequence are not so freely available and in the case of one maker some sales of 2X foundry at 50 cents advance to $15.25, furnace, or $16, delivered this territory, have been closed. Some brands are still obtainable at $15.50, delivered, for early shipment, but practically all makers will not accept second half orders except at round advances. Tonnage sales in the market are less conspicuous because the heaviest buyers, the steel mills and the cast iron pipe interests, are not so active at present, having bought liberally of late. The inquiry is good, however, and is composed chiefly of small lots which represent the interest of many melters and is regarded as a favorable condition. Basic consumers are well covered at present, on the ruling scale of steel works activity and no further sales are noted. The last sales were made at $14.50, delivered, but makers now hold out for $15, delivered, though the market is untested at this figure. One maker, however, has recently refused an offer of $14.65, delivered, for first half tonnage. The low prices for New England shipment, or $15.50, delivered, for No. 2X, which some eastern Pennsylvania furnaces have been meeting, appear to be less general, as one furnace in this territory is reported to have made a sale to such district at a considerably higher figure, and it is announced from Buffalo that one leading maker there has put up its schedule to $15, furnace. One Delaware river cast iron pipe maker is out for 2,000 tons of No. 3 and forge for early shipment. A sale of 2,000 tons of Alabama iron to this territory is reported. Considerable iron has lately been closed with Virginia furnaces and at better prices, one maker having just booked about 5,000 tons. The minimum of the market there is now more firm at $13 for first quarter, with higher prices asked for second quarter. Sales of

2X at $13.35 and $13.50, furnace, for second quarter are noted. Virginia pipe makers have been recent buyers and a Lynchburg interest has taken on a block of about 10,000 tons of lower grades. The Tidewater furnace at Chester, Pa., blew in this week on basic and the Princess furnace in Virginia will resume about the first week in March. We quote for prompt and first half delivery in Philadelphia and vicinity as follows:

No. 1X foundry	$16.00 to 16.25
No. 2X foundry	15.50 to 15.75
No. 2 plain	15.00 to 15.50
Standard gray forge	14.25 to 14.50
Basic	14.50 to 15.00
No. 2X Virginia	15.65 to 15.80
No. 2 Southern	15.00 to 15.50
Standard low phosphorus	21.00 to 21.50

Finished Material.—Mill operations continue to expand under the increased volume of new bookings being entered practically in all lines. Some of the most favored of the eastern plate mills have raised their operations to about 75 per cent. The Sparrows Point and Steelton steel works are running at about 70 per cent of capacity.

Due principally to the rising scrap market, eastern bar iron makers have advanced their schedules about $2 a ton and some are now holding at 1.30c, mill, while others are asking 1.35c, mill.

The Panama Canal Commission is calling for bids to close March 24, on 10,000 tons or more of track material and castings, including 1,600 tons of steel cross ties, 635 tons of channels, 900 tons of slab covers, 3,250 tons of carbon castings, 2,400 tons of semi-steel castings and other miscellaneous castings and supplies. This material is for lock construction of the canal. The Belmont Iron Works is the low bidder on about 1,500 tons of steel frames of angle construction for the Isthmus. The American Bridge Co. has 700 tons for a cotton mill at Greenville, S. C. Bids have been asked for a coal storage building and warehouse for the Curtis Publishing Co., this city, which will require about 2,000 tons. Bids go in this week on the Woodward building, Washington, D. C., the steel for which, by latest estimate, will be about 1,000 tons. An addition to the Emerson hotel, Baltimore, about 400 tons, is up. Sharp competition for fabricated tonnage prevails in eastern markets and some low prices are noted.

We quote for delivery in Philadelphia and vicinity, as follows:

Structural shapes, 1.55c to 1.60c; steel plates, 1.55c; steel bars, 1.55c to 1.60c; refined bar iron, 1.35c to 1.40c; 4 x 4-inch open-hearth rolling billets, $25.40; forging billets, $30.40.

Old Material.—The scrap market has been in a rather excited condition the past week owing to the many reports of advanced prices that have been current. Prices generally are up about $1 a ton and more in some grades and sellers are more reluctant to close even at higher levels. The principal activity has been in heavy steel where probably 10,000 tons in scatered lots including one of 4,000 tons have been closed, principally at $14.50, delivered. One mill took on a small lot for immediate shipment at $15, delivered, while a broker took less than 1,000 tons at $15.25, delivered, on speculation. A sale of No. 1 railroad wrought at $18, delivered, is noted, but this is above the market, which ranges at from $17 to $17.50, delivered. Bar iron makers are putting up their prices in line with higher scrap costs. Borings and turnings are selling higher. A sale of a quantity of old steel rails at $15, delivered, is noted. We quote gross tons delivered in eastern Pennsylvania consuming territory, as follows:

Old iron rails	$17.00 to 17.50
Old steel rails (re-rolling)	15.50 to 16.50
Heavy melting steel	14.50 to 15.00
Old car wheels	14.00 to 14.50
Old iron car axles	25.00 to 26.00
Old steel car axles	20.00 to 21.00
No. 1 R. R. wrought	17.00 to 17.50
Wrought pipe	14.00 to 14.50
Cast borings	9.25 to 9.75
Wrought turnings	10.00 to 10.50
Heavy cast scrap	14.00 to 14.50
Railroad malleable	12.50 to 13.00
Stove plate	12.00 to 12.50

ST LOUIS

Steel Foundries Buy Basic—Some Foundry Grade Sales.

Feb. 20.

Pig Iron.—Two large steel foundries have purchased basic, one taking 5,000 tons and the other 10,000 tons. All of the inquiry for 3,000 tons of southern iron that was put out by a concern in Quincy, Ill., the first of last week, was closed Saturday. The orders were divided among several St. Louis sales agents. Besides this order, there was quite a good deal of purchase last week in small lots, and inquiries were received this morning for a considerable tonnage, divided into small lots lost to various concerns in the St. Louis territory. While no big business is in sight, local salesmen consider conditions decidedly brighter than they have been for some time. We note the sale of 1,000 tons of southern No. 2 foundry today. Prices remain firm at $11, Birmingham basis, for No. 2, for immediate shipment, and future quotations holding firm at $11.50. Our quotations, tabulated, for southern iron, delivered, to which the Birmingham freight has been added, follow:

Southern No. 1	$15.25 to 15.75
Southern No. 2	14.75 to 15.25
Southern No. 3	14.25 to 14.75
Southern No. 4	13.75 to 14.25

Coke.—Quotations on coke have not changed with the last week as a general thing, but some dealers believe there will be an advance of 10 cents a ton on the better grades within the near future. Business is generally quiet, however, but it is expected to brighten up shortly. We note the sale of 2,000 tons of foundry coke.

Our prices remain nominally as follows:

We quote 72-hour Connellsville foundry grades, $2.35 to $2.50 for whole of 1911; 72-hour foundry, $2 to $2.25, on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.60 to $1.85; best 72-hour Virginia foundry, $2 to $2.35; 48-hour Virginia furnace, $1.60 to $1.85. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Old Material.—Everybody seems to have heavy stocks of scrap iron. There is very little demand for it, and prices remain nominally as follows:

Old car wheels	$13.50 to 14.00
Old iron rails	14.50 to 15.00
Rerolling rails (4 ft. and over)	13.00 to 13.50
Old steel rails (2 ft. and under)	12.00 to 12.50
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	24.50 to 25.00
Frogs, switches and guards	12.00 to 12.50
Heavy melting steel	12.00 to 12.50
Shoveling steel	12.00 to 12.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.50 to 12.00
No. 2 R. R. wrought	10.50 to 11.00
Arch bars and transoms	14.00 to 14.50
Knuckles, couplers and springs	12.00 to 12.50
Shafting	15.00 to 15.50
Iron car axles	18.50 to 19.50
Steel car axles	18.50 to 19.50
Locomotive tires	14.50 to 15.00
No. 1 country wrought	9.50 to 10.00
Pipes and flues	9.00 to 9.50
No. 1 cast, 510 lbs. and less	12.00 to 12.50
No. 1 busheling	10.25 to 10.75
No. 2 busheling	7.00 to 7.50
No. 1 boiler cut	9.00 to 9.50
Boiler punchings	10.25 to 10.75
Cast and mixed borings	5.00 to 5.50
Machine shop turnings	7.00 to 7.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.00 to 9.50
Stove plate and light cast scrap	9.50 to 10.00
Angle splice bars, iron	13.25 to 13.75
Angle splice bars, steel	12.00 to 12.50

BUFFALO

Prices Showing Some Tendency to Advance From Present Low Levels.

Buffalo, Feb. 21.

Pig Iron.—A continuance of fairly good business and a generally stronger tone has been noticeable in the pig iron market in this district during the past few days. Prices, which reached a very low mark a couple of weeks ago, are now showing a tendency to advance, and it is predicted that a marked raise of prices will soon go

into effect. Inquiries are coming in well, and a fairly large tonnage has been booked, but mostly in small lots.

We quote f. o. b. furnace as follows:

No. 1X	$14.00 to 14.50
No. 2X	14.00 to 14.50
No. 2 plain	13.75 to 14.25
No. 3	13.75 to 14 00
Gray forge	13.50 to 14 00
Malleable	13 75 to 14.00
Basic	14.50 to 15.75
Charcoal	17.25 to 18.00

Finished Products. — Specifications have been coming in fairly well and business in finished products is showing some improvement. Structural material, which has been very dull, is beginning to pick up a little, although all that has been reported in the last week is a few small jobs down the state. A fairly large tonnage of tin plate has been placed mostly for delivery during the latter part of March and the first of April. Wire products are very active. Some improvement is noted in the demand for cold rolled steel. There is a strong demand for steel bars.

Old Material.—The scrap market continues dull. A few sales have been made, both in and out of the district, but there seems to be little interest. We quote, f. o. b. Buffalo, as follows:

Heavy melting steel	$12.75 to 13.00
No. 1 railroad wrought scrap	14.75 to 15.25
No. 1 railroad and machine cast scrap	14.00 to 14.50
Old steel axles	18.50 to 19.00
Iron axles	23.00 to 24.00
Car wheels	13.75 to 14.25
Railroad malleable scrap	13.75 to 14.00
Machine shop turnings	7.00 to 7.25
Cast iron borings	6.50 to 6.75
Low phosphorus steel scrap	17.00 to 17.50
Old iron rails	16.75 to 17.25
Tank iron	10.75 to 11.25
Sheet iron	6.50 to 7.00
Pipes and flues	10.75 to 11.25
Stove plate	12.00 to 12.50
Grate bars	11.50 to 12.00
Boiler plate	11.50 to 12.00

BIRMINGHAM

Pig Iron Market is Stronger—One Furnace Withdraws.

Birmingham, Feb. 20.

Pig Iron.—There is a great deal more strength unduobtedly to the pig iron market here now than has been the case for many months. One furnace interest has entirely withdrawn from the market, while another has marked up to $11.50 for No. 2. Each furnace company seen reports shipments thus far in February as in excess of the make. If this should continue through the remainder of the month, there is apt to be a very material reduction in Alabama stocks,—and for some six months now these stocks have been looked upon as excessive to a degree. There is no prospect of any addition to the producing rate before July,—and it is generally thought it would take a $12.50, Birmingham, market to put any other stacks in blast. On the other hand, it is thought at least two of the Alabama furnace stacks now running must be blown out at an early day for general overhauling. Sales the past week have been reported as very satisfactory and the selling agents generally report themselves as confident the turn has been reached, though few of them dare express themselves so optimistically as to say they expect any marked advance for a long time to come.

Cast Iron Pipe.—With one of the large foundries in the district idle, there has been a tendency to stiffen up slightly on quotations. For some time the quotations appearing in these columns have been only nominal, and on desirable business, where competition has been keen, each maker has been a "law unto himself" in going after such business. It is known, however, that contracts secured by one water piper maker in the central west since Jan. 1 have been of such volume as to cause a decidedly more "bullish" feeling on the part of the management. Any advance in pig iron will most surely be immediately reflected in the market price of water and gas pipe. We quote f. o. b. cars this district as follows:

4 to 6-inch, $20.50; 8 to 12-inch, $19.50; over 12-inch, average $18.50, with $1 differential in favor of gas pipe.

Old Material.—The improved feeling in pig iron, as well as the advanced prices on some forms of finished products, has had a sympathetic effect on scrap. Buyers here are rather inclined to pay a little more than prices prevailing at the close of 1910, but on the other hand the dealers feel that they have nothing to lose by refusing to enter large orders at this time, and there is a marked tendency not to force anything on the market, but rather to wait for a still better price.

Old iron rails	$13.50 to 14.00
Old steel axles	16.50 to 17.00
Old iron axles	17.00 to 17.50
No. 1 R. R. wrought	11.50 to 12.00
No. 2 R. R. wrought	10.50 to 11.00
Dealers' wrought	10.00 to 10.50
Old steel rails	11.00 to 11.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	10.00 to 10.50
Old standard car wheels	12.50 to 13.00
Light castings, stove plate	8.50 to 9.00

Coal and Coke.—Some nice orders for foundry coke have been closed this week. One large contract for California is pending, with good prospect for placing Alabama coke with the buyers. Furnace coke continues dull, while the coal business is quieter than it has been for eighteen months, with prices very weak.

SEATTLE

Foreign Ore Being Ordered—Improved Demand For Sheets and Bars.

Seattle, Feb. 16.

Pig Iron.—A few orders are beginning to be placed for future delivery of foreign iron by the coast jobbers for delivery during the second quarter. About 2,000 tons have been placed by the Seattle houses, while Tacoma and Portland firms have contracted for about 1,000 tons each. The feeling is that these are only incidental to larger orders in the very near future. The number of consumers is increasing steadily in the section and it is to supply some of the new industries that the orders are being placed. The strong competition of the southern brands, however, is cutting down the usual run of contracts for foreign iron and this year more than ever before this has been felt by the dealers. The lumber mills are keeping up the spurt of two weeks ago and this has its effect in bringing several substantial orders to the foundrymen.

We quote spot iron in gross tons foreign ex-ship Puget Sound or Columbia river domestic, f. o. b. Pacific coast terminal, as follows:

	Prompt.	Second quarter.
No. 1 Glengarnock	$24.50	$24.50
No. 1 Eglinton	23.50	24.00
No. 1 English Jarrow	23.50	23.50
No. 1 Chinese Hanyang	23.50	23.00
No. 1 Clevelard	23.50	23.50
English Doncaster	23.00	23.00

Finished Material—A large amount of county building and municipal work throughout the northwest has brought a large demand for sheets and bars. A number of the county officials have just begun working out the budget for the year and placing contracts and the sheet market is made especially strong. The railroads are also entering this field with substantial orders and dealers are having some little trouble in making deliveries. The wire product market has also felt a stronger demand and is firming up considerably.

Old Material.—Improvements by the various Puget Sound electric companies have thrown more material on the already over-stocked scrap market, as a number of them are engaged in laying new tracks and generally improving such facilities. The tearing up of the old Madison street cable line for

its electrification placed 25 carloads of miscellaneous material on the market last week and most of it was yarded by the Chicago Junk Co., which took the lot. A number of firms have bid on the 700 tons of steel scrap, 100 tons of brass and large lot of miscellaneous which the navy department will sell at the Bremerton yard next week. Several San Francisco dealers have also visited the yard to look over the government offering. The logging railroads have also made some inquiries in the market with the view of disposing of considerable material at various camps.

Foundry scrap No. 1	$17.00 to 18.00
Foundry scrap No. 2	12.00 to 14.00
Old car wheels	15.00 to 16.00
Railroad wrought	10.00 to 12.00
Miscellaneous steel scrap	6.00 to 9.00
Grate bars	4.50 to 6.00
Stove plate	9.00 to 10.00

British Iron Market.

Lower Price of Pig Iron Mystifies, But Finished Lines Strong.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, Eng., Feb. 11.

The peculiar feature of the pig iron trade in which Cleveland iron has fallen altogether below the general level, is still more noticeable than at the beginning of the week. The price of No. 3 iron yesterday at Middlesbrough fell another 1½d, to a minimum of 48s 8½d ($11.93) per ton, which is only one penny above the minimum of last year, and a lower figure than has been reported since July 21. Shipments are very poor, worse even than shown by the low figure of last month. The stock increase is not quite so rapid as it was, the amount in store now being 557,002 tons. Generally speaking, the effect upon other markets has not been noticeable, although there have been a few cases of slight easing of prices. In regard to forward Cleveland buying, the figure for monthly transactions is 49s ($12) and for three months 49s 6d ($12.12). A very material element in maintaining selling figures is the high price of coke, which has advanced 1s per ton within the last fortnight, and 6d on the week. The hematite market in the North of England continues the stronger of the two, with mixed numbers selling at 65s 6d ($16.40) and higher prices for forward transactions.

Finished Department.—Production is, if anything, on the increase. The better reports from America have had a good effect, and have been of marked value to the steel trade, as it is considered that competition from America need not now be feared. There is still a large importation, especially by way of South Wales, but the British houses maintain their recent prices for crude steel at £5 to £5 2s 6d. The Belgian market is also increasing in strength. At the same time, it is noteworthy that British prices do not increase, and it is clear that this is due to the constantly increasing output due to mechanical improvements and better organization. The iron trade, as distinct from the steel trade, shows everywhere the unsatisfactory feature of low prices associated with heavy production.

METAL MARKETS

St. Louis.

Feb. 20.

Lead and Zinc.—A top price of $45.50 a ton was realized for choice lots of lead in the Missouri-Kansas-Oklahoma district last week, on an assay base of $42.50, the base ranging down to $38. The market was decidedly strong.

The contract price was based on spelter quotations at East St. Louis, Ill., of $5.345, an average for the previous week. Spelter rose last week to $5.425 and $5.45, with indications that it will go to $5.50 before the present week closes.

Calamine showed strength at $20 to $24 a ton on an assay base of 40 per cent, with choice lots bringing $36.75.

The top price reported for lead was $56 a ton, though much of the ore was sold for $55. Shipments of lead were heavy.

New York.

Feb. 20.

Tin.—On a reduced volume of business, the foreign pig tin market has fluctuated over a wide price range during the past week. Spot sold at £200 on Wednesday, at £187 Friday, and advanced to £194 today. Domestic quotations have displayed the same erratic character, and dealers and consumers are completely at sea over the question of what the market will be from hour to hour; and none of them will touch it beyond daily needs. In the local market, spot continues to command a premium of between 2½c and 3c above cost to import. At the close today, 45.25c for spot is the ruling price, and from 42.50c to 42.25c for March and April. Statistics have little value under present conditions, but it is important to note that both arrivals at Atlantic ports, and shipments from the Straits are being favorably estimated for this month, as compared with the same period in 1910. Powell's cable reports that 2,020 tons were shipped from the east during the first half of February, and it is estimated that the total will approximate 4,200 tons. The arrivals of tin since Feb. 1 are 2,200 tons, and there are 2,880 tons afloat. A large part of the latter will probably come in for February delivery.

Copper.—Producers and selling agencies report that a good volume of business is being done in copper metal at the present level of 12.50c, delivered, 30 days, with both domestic and foreign consumers. There are signs of improvement in the demand for finished material in this country and less pessimism is noticeable among manufacturers, which has imparted a better tone to the metal market. Lake copper has sold as low as 12.62½c recently, but 12.75c is considered the ruling price. The London market has displayed a lack of speculative interests, and daily sales have been light with small changes in prices. At the close today spot sold at £55 5s and futures at £55 17s 6d.

Lead.—Independent sellers are offering lead from 2½ to 5 points under the American Smelting & Refining Co. in New York, but it is not likely the latter is losing much of its established business because of the differences. The two extremes being paid for the metal in New York are 4.45c and 4.50c.

Spelter.—There is a fair demand for spelter, and considerable talk is heard of higher prices. Sales have been made at 5.65c in New York, but the general quotation is 5.60c.

Antimony. — It is understood that makers of special brands of antimony are confidentially advising that prices will advance soon. The demand has not been stimulated by the rumor, however. Cookson's is 8.25c, Hallett's is 7.75c, and Hungarian is 7.12½c.

Chicago.

Feb. 21.

New Metals.—Trading in copper during the past week was fairly heavy, although the market is a little weak. Prices in Chicago remain unchanged. Spelter is now quotable 5.50c, Chicago, this being an advance of 15 cents over minimum quotations a week ago. The demand for spelter is fair and the market is firm. Lead is strong. Tin is again very high and consumers, except when compelled to do so, are not buying. The local market is now quoted 45½c, Chicago, in round lots.

We quote, dealers' selling prices, f. o. b Chicago, as follows: Lake copper, carload lots, 12⅞c; casting, 12¾c; smaller lots, 1¼c to ⅜c higher. Spelter, car lots, 5.50c to 5.55c; lead, desilverized,

4.45c, in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $7.50 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 45½c; Cookson's antimony, 10c; other grades, 9c to 10c.

Old Metals.—The high price of pig tin is causing consumers to purchase scrap tin wherever it can be used and this has caused a slight firmness in tin pipe and tin foil in the local market.

We quote, dealers' selling prices, f. o. b. Chicago, as follows: Copper wire, 12½c; heavy copper, 12¼c; light copper, 11¼c; heavy red brass, 11c; heavy yellow brass, 9c; light brass, 7c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 7½c; brass clippings, 8½c; tea lead, 3.80c; lead scrap, 4¼c; zinc, 4.60c; tin pipe, 39c; tin foil, 36c; pewter, 27c; electrotype plates, free from wood, 4c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; linotype dross, 3¼c; prime slab zinc dross, $75 per ton.

Will Discuss Employer's Liability

A distinctive feature of the coming annual convention of the National Metal Trades Association has just been decided on by the executive committee of the association. It will be a session given over wholly to consideration of employers' liability insurance. Commissioner Robert Wuest has been instructed to secure speakers who are thorough students of this very timely subject, now engaging the attention of many state legislatures. The convention will be held April 12-13, at the Hotel Astor, New York City.

Boilermakers' Strike

A strike of union boilermakers employed in the shops of the New York Central lines was called, Feb. 20, because of a dispute originating in the Collinwood, O., shops. The company has sought to install the piecework system in some portions of the boiler shops, and this is being resisted by certain union employes. Independent workmen in sufficient number have been secured to man the Collinwood shops.

Northern Ore Dividend

Trustees of the Great Northern Iron Ore properties have declared a dividend of 50 cents per share, the same as in November, 1910. Previous dividends were 50 cents, declared in August, 1910, and February, 1910, and $1 in August, 1909, February, 1908, and August 1907.

CONTRACTS AWARDED

To Cooper Company by Republic Company and Technical Schools.

The C. & G. Cooper Co., Mt. Vernon, O., through its Pittsburg office, has been awarded a contract by the Republic Iron & Steel Co., covering a 3,000-horsepower cross compound Cooper Corliss engine to drive the new Morgan continuous merchant mills to be installed at Youngstown, O. The engine will be direct-connected to the mills by means of steam return cranks. This engine is practically a duplicate of a Cooper engine of this type driving a mill at the International Harvester Co.'s South Deering works.

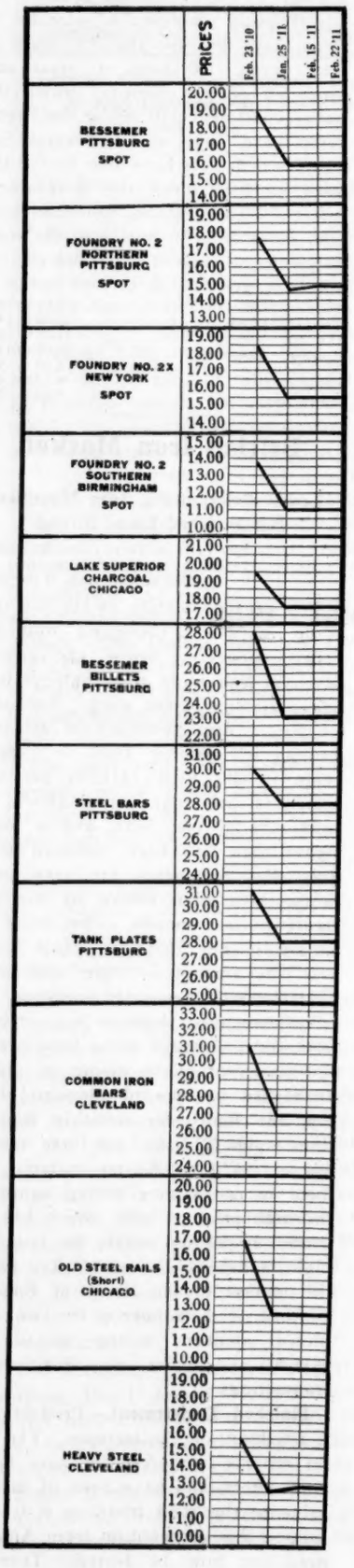
An order has also been received by the C. & G. Cooper Co., from the Carnegie Technical Schools, Pittsburg, for a 75-horsepower Corliss engine to be installed in the mechanical engineering department for testing and other experimental purposes in connection with courses of instruction in steam and mechanical engineering. This engine will be equipped with a combination rope fly wheel, the face of which will be grooved for seven 1-inch ropes. A brake wheel will also be mounted on the main shaft for power measurements and regulation tests. The engine will be built to run 150 revolutions per minute.

Strike Soon Ended

The strike of the furnace men and kiln men employed at the plant of the Lake Superior Iron & Chemical Co., at Ashland, Wis., declared Feb. 15, was terminated Saturday, Feb. 18. The plant was banked Wednesday night, and Manager J. E. Johnson announced that it would not be started until two-thirds of the men voted to return to work on the terms offered by the management, the men who were considered to have been responsible for the trouble never to be re-employed. Such a vote was carried Saturday morning, and the plant started Saturday afternoon without difficulty. No concessions of any kind were made to the strikers. Notice of a reduction of wages 10 per cent was posted about a month ago.

The Portsmouth Steel Co., Portsmouth, O., advises that it is not planning a corrugating works in connection with its Portsmouth plant, as has been published, and is at a loss to understand how the report originated.

PRICE CHART



WORLD'S CONFERENCE

Of Steel Makers at Brussels Will Attract American Delegation.

A large delegation of leading iron and steel manufacturers of the United States is expected to be present as guests of honor at an international conference of iron and steel makers, which will be held at Brussels, Belgium, in July. The idea of holding such a gathering of steel makers of the world, originated at the meeting of the American Iron and Steel Institute last October, when the score or more of manufacturers present from Great Britain and continental Europe extended the invitation to their American hosts to reciprocate by a trip to Brussels. By reason of the accessibility of the Belgian city to practically all the steel producing nations of Europe, a very large representation of foreign makers is expected to be in attendance and the meeting will probably be one of the most illustrious in the history of the world's iron industry. His highness, the king of Belgium, who has long been a prominent patron of the iron and steel industry of his country, by reason of a practical knowledge of the business, gained in his earlier years, will lend his most cordial support to the conference. According to advices recently received in this country, the meeting will open on July 5, and will in all probability continue for three days. The American Iron and Steel Institute will shortly take up the consideration of matters in connection with the attendance of a delegation of its members at the conference.

Official Changes

W. O. Jacquette and R. A. Bole were elected vice presidents of Manning, Maxwell & Moore, Inc., succeeding Chas. A. Moore Jr., and J. B. Brady, resigned, at the recent annual meeting held in New York. Chas A. Moore Jr., also retired from the board of directors and was succeeded in the office of secretary by Treasurer C. M. Chester Jr. The other officers were re-elected.

The United States circuit court at Philadelphia has dismissed the suit of the Krupp works, Germany, against the Midvale Steel Co., in which infringement of armor plate patents was charged. An appeal has been taken by the Krupps.

Geo. C. Foote was named as a member of the board of directors, succeeding Wallace T. Foote, deceased, of Witherbee, Sherman & Co., Inc., at the annual meeting recently held. The other directors re-elected were: F. S. Witherbee, W. C. Witherbee, E. A. S. Clarke, Moses Taylor and L. W. Francis. The officers re-elected are: F. S. Witherbee, president; E. A. S. Clarke, vice president; W. C. Witherbee, treasurer, and L. W. Francis, treasurer.

Nova Scotia Steel's Annual Report

Toronto, Can., Feb. 20.

The directors of the Nova Scotia Steel & Coal Co. on Feb. 17 increased the dividend from 5 per cent to 6 per cent. The submitted statement for 1910 was a very favorable one, and showed profits of $1,140,504, as against $907,949 for 1909. An important decrease in fixed charges has resulted from the recent re-financing of the company, whereby the rate of interest on bonds was reduced from 8 to 5½ per cent. The value of current assets is now $2,351,326, an increase of about $348,000. The company has $498,787 cash in bank. Current liabilities have decreased from $999,109 to $555,039. The position of the company is therefore nearly $800,000 better than last year as regards current assets and liabilities.

President Harris denied the statement that the dividend was being increased in order to facilitate the placing of a block of stock abroad. He stated that the directors had an attractive offer for 18,500 shares at a figure considerably above par but had refused it, believing that the future had better things in store.

Locomotive Works Sold

Chicago, Feb. 21. (By wire.)

The plant of the Hicks Locomotive & Car Works, Chicago, was sold today by the receiver to Col. William Barbour of New York for $470,000. Col. Barbour and associates expect to make some necessary repairs, rehabilitate the plant and place it in operation.

The Reeves Mfg. Co., Canal Dover, O., which recently increased its capital stock to $500,000, has taken over the property and business of the Dover Forge & Iron Co., also of Canal Dover. The combined plants are to be considerably improved and enlarged. Two sheet mills and a galvanizing department will be added and the present roofing department will undergo extensive alterations and additions. The officers of the consolidated concern are: President, A. A. Frazer; vice president, James Rees; secretary and treasurer, A. J. Krantz.

EQUIPMENT ORDERS

And Reason They Fell Off in Year Just Closed.

The eighteenth annual report of the Chicago Railway Equipment Co. has just been presented, which contains the following figures:

CURRENT ASSETS.

Inventories	$579,589.01
Advances, etc.	180,010.00
Accounts received and cash	550,415.42
Total current assets	$1,310,014.43
Deferred charges to future operations	20,149.38

CURRENT LIABILITIES.

Reserves:	
Bills payable	$85,924.81
Contingencies	20,000.00
Shrinkage in Inventory	25,000.00
Depreciation	106,925.73
Add—Ap. from earnings	50,000.00
Total	201,925.73
Surplus	523,027.09

Among other things President E. B. Leigh said:

The opening of the calendar year 1910 seemed to indicate a rapid return to normal conditions and general prosperity. This was confirmed in the developments of the first half of the year, and during which period your company secured a fair volume of business. With the beginning of the latter half of the year, the efforts of the railroads to establish a schedule of generally increased freight rates to meet their growing necessities for increased revenue, precipitated a bitter controversy on the part of the organized shipping interests of the country, who opposed the proposed advances with all the force and influence at their command, and this too before any attempt was made to determine the equities of the question. The immediate and continuing effect of this was, and has been, to cause great conservatism on the part of railroad managers, and with a very marked curtailment of purchases, a condition which still exists.

Referring to the work of the Railway Business Association, President Leigh said:

At the risk of possible repetition your president feels impelled to again refer to this organization and the tactful, potent and valuable influence it has undoubtedly exerted on the ultimate solution of the freight rate question. With the full consciousness and belief that government regulation of railroads is now the composite and definite will of the people, already crystallized into law, that it has come and come to stay; the efforts of this organization have been directed, not toward thwarting regulation, but toward bringing into concerted action the seemingly antagonistic elements in a united effort to secure an equitable adjustment of this question by the interstate commerce commission. With the rate question settled, it is believed that at least a reasonably fair volume of business will come to your company during the present year.

RAIL PRODUCTION

Shows Continued Increase of Open-Hearth Output.

According to statistics compiled by the American Iron and Steel Association, the production of all kinds of rails in the United States in 1910 amounted to 3,634,029 tons, against 3,023,845 tons in 1909, an increase of 610,184 tons, or over 20.1 per cent. Rails rolled from purchased blooms, crop ends, scrap and "seconds," and rerolled and renewed rail are included. The maximum production of all kinds of rails was reached in 1906, when 3,977,887 tons were rolled.

Of the total production of steel rails in 1910, 3,460,943 tons were rolled from ingots made by the makers and 172,856 tons were rolled from purchased ingots or blooms, crop ends, "seconds," or renewed or rerolled rails.

Bessemer Steel Rails.—The production of Bessemer steel rails in 1910 amounted to 1,917,900 tons, against 1,767,171 tons in 1909, an increase of 150,729 tons, or over 8.5 per cent. Of the total in 1910, 1,829,954 tons were rolled by makers of domestic ingots and 87,946 tons by companies which did not operate Bessemer converters. Included in the total by makers of ingots are 68,497 tons of rerolled rails.

Open-Hearth Steel Rails.—The production of open-hearth steel rails in 1910 was 1,715,899 tons, against 1,256,674 tons in 1909. The increase in 1910 over 1909 was 459,225 tons, or more than 36.5 per cent, while the increase in 1909 over 1908 was 684,883 tons, or over 119 per cent. Almost all the open-hearth rails in 1910 were rolled from basic steel, and virtually all were rolled by producers of open-hearth ingots. Indiana was the largest maker of open-hearth rails in 1910, followed by Pennsylvania, Alabama, Colorado, Ohio, Maryland, New York and California, in the order named.

Iron Rails.—The production of iron rails in 1910 was 230 tons, all rolled in Illinois.

Alloyed Rails.—Included in the 3,633,799 tons of steel rails rolled in 1910 are 200,621 tons of alloyed steel rails, as follows: Titanium rails, 195,408 tons; electric rails, 4,210 tons; ferro-titanium rails, 532 tons; manganese rails, 390 tons; and nickel chrome and vanadium steel rails, 81 tons. Of the total 174,822 tons were rolled from Bessemer steel and 25,799 tons from open-hearth steel. In 1909 the production of alloyed steel rails was 50,724 tons.

PRODUCTION OF RAILS.

States, gross tons.	Bessemer.	Open-hearth.	Total.
Pennsylvania ..	591,502	395,230	986,732
Other states....	1,326,398	1,320 669	2,647,297
Total for 1910..	1,917,900	1,715,899	3,634,029
Total for 1909..	1,767,171	1,256,674	3,023,845
Total for 1908..	1,349,153	571,791	1,921,015
Total for 1907..	3,380,025	252,704	3,633,654

PRODUCTION BY STATES.

Bessemer rails.	1908.	1909.	1910.
Pennsylvania ...	315,547	553,719	591,502
Other states....	1,033,606	1,213,452	1,326,398
Total	1,349,153	1,767,171	1,917,900

WEIGHT OF RAILS.

Kinds of rails. Gross tons.	Under 45 pounds.	45 pounds and less than 85.	85 pounds and over.	Total. Gross tons.
Bessemer rails	190,455	861,591	865,854	1,917,900
Open-hearth rails	31,977	424,381	1,259,541	1,715,899
Iron rails	230	.....	.....	230
Total in 1910	222,662	1,285,972	2,125,395	3,634,029
Total in 1909	255,726	1,024,856	1,743,263	3,023,845
Total in 1908	183,869	687,632	1,049,514	1,921,015
Total in 1907	295,838	1,569,985	1,767,831	3,633,654

Gear Makers Entertain

The William Ganschow Co., 1001 Washington boulevard, Chicago, held a reception Saturday evening, Feb. 18, entertaining about 400 foremen and shop superintendents from all points in the central west. The William Ganschow Co. operates an extensive plant devoted exclusively to the manufacture of gears, and the visitors were able to see all parts of the shop in full operation. No special program was presented, but the members and officers of the company were all on hand to explain the various processes to the visitors. The tools which probably attracted most attention were a battery of automatic turret lathes of the latest pattern, bevel gear planers and the large spur-gear cutting machines, which will cut gears up to 14 feet in diameter.

One department of the shop is devoted to the manufacture of rawhide pinions and visitors in this department were able to observe all the processes involved in the manufacture of the rawhide gears, from the treatment of the raw material to cutting the blanks.

A sumptuous buffet luncheon was served throughout the evening. The entertainment was a success from every point of view and thoroughly enjoyed by the visitors. It is the first exhibition of the kind which this company has held, and it is very probable that it will be made an annual event.

MORE COAL LAND

Purchased by Crucible Steel Co. For Coke Purposes.

The Crucible Steel Co. of America, Pittsburg, which recently took over the properties of the Midland Steel Co., Midland, Pa., and several small steel plants, has purchased 2,000 acres of coking coal lands in Greene county, Pa., along the Monongahela river, for $1,600,000. The land was purchased from J. V. Thompson, Uniontown, Pa., and others. The deal was handled through J. H. Hillman & Son, Pittsburg. The coal will be mined and shipped by water to Midland, Pa., where the Crucible Steel Co. owns 250 beehive ovens, which were included in the recent purchase of the Midland Steel Co.'s properties. The purchase of the Greene county coal properties caused some surprise in steel circles, as it was known that a tract of 1,800 acres of coal lands at Midland, Pa., was included in the Midland deal. It is said, however, that the Midland coal properties consist of steam coal, while the Greene county property is high-grade coking coal. As far as can be learned, the Crucible company will not build any additional coke ovens at Midland at present, the present battery of ovens being sufficient to take care of the one blast furnace at that place. Another blast furnace will be built later and it is probable that additional coke ovens will be built in the course of a few years. It is understood that a few parcels of real estate figure in the Greene county deal.

Centralizing Shops

Spang, Chalfant & Co., Inc., Pittsburg, advising respecting some recently noted new construction at its Etna, Pa., works, says that it has not finally decided upon either the type or size of building it intends to erect. Practically no new equipment will be required, as the plan contemplates the centralizing of offices and machine shops scattered throughout the different parts of the works.

The Moline Foundry Co., Moline, Ill., is planning to build this coming summer another addition to its foundry, using all the available space remaining on the present site. The new building will be two stories, brick construction, 50 x 60 feet. The lower floor will be used for melting purposes, and the second floor as a pattern shop. An air compressor and other equipment, including molding machines, will be needed.

TWELVE NEW MILLS

Will be Added to Tin Plate Plant by Jones & Laughlin Steel Co.

The Jones & Laughlin Steel Co. has authorized the construction of 12 new tin mills at the Aliquippa, Pa., plant, doubling the capacity of the present plant. Work is to be started immediately and the new mills will be ready for operation some time during the third quarter of this year. No new buildings will be necessary, as provisions for the additional mills were made in the original contract for the initial installation of 12 mills. Contracts for machinery, etc., will be awarded immediately. Eventually the Aliquippa tin plate plant will consist of a total of 36 tin mills, which will be the largest in the world.

In July, 1909, the company awarded a contract to the Standard Engineering Co. for ten hot mills and a corresponding number of cold mills. Six mills were placed in operation, May 3, 1910, and the remainder were started a few weeks later. The 12-mill plant has been in steady operation since early last fall and is booked to capacity for the next several months. During the early part of the year, the Aliquippa plant established a new high production record. The 24-mill plant will have an annual capacity of approximately 2,000,000 base boxes of tin plate and the working force will be doubled.

Since the new tin plate plant was started last year, tin bars have been shipped from the Southside works of the Jones & Laughlin Steel Co., but eventually tin bars will be made at the Aliquippa works.

Pig Iron Meeting

A meeting of blast furnace operators of the central west, representing 24 stacks, was held in Cleveland, Feb. 17. Present conditions in the trade were thoroughly discussed, and the feeling expressed was much more hopeful than prevailed at the meeting held a month earlier. It developed that the stocks on hand at furnaces represented were somewhat less than half of the orders on books for forward delivery. Sixty-five per cent of the stacks represented at the meeting were in blast, and one operator present reported that during the preceding 48 hours he had turned down offers for about 60,000 tons of pig iron, feeling that with conditions existing, a stronger and better price would develop.

Mining Engineers' Election.—At the annual meeting of the corporation of the American Institute of Mining Engineers, held in New York, Feb. 21, Charles Kirchhoff, of New York, was elected president of the council. Dr. R. W. Raymond, also of New York, was re-elected secretary of the council. The February bulletin of the Institute has been issued and contains the following papers: "Copper Blast-Furnace Tops," by N. H. Emmons, and "Development of Hindered-Settling Apparatus," by Robert H. Richards.

Tonnage Tax Bills

Two bills have been introduced in legislatures of states wherein are situated the most productive iron ore mines of the country, viz.: Michigan and Minnesota. The Michigan tax bill is framed along similar lines embodied in like legislation proposed before. Last week is was decided after hearings before house committees to push the bill to a vote. In a published speech Governor Osborn is quoted as declaring that he is not for the tonnage tax. Copper as well as iron ore mines are included in the measure, whose terms are declared by some experts as almost confiscatory. In Minnesota, the bill is also framed in almost the same terms as was the measure passed two years ago but vetoed by the then Governor Johnson, now deceased.

Will Build New Foundry

The Taylor & Boggis Foundry Co., Cleveland, which recently disposed of its property on East Fifty-fifth street and Euclid avenue, to the Pennsylvania Railroad Co., has concluded the purchase of a large tract near the intersection of East Ffty-fifth street and the Erie railroad tracks, that city. The Taylor & Boggis company will have plans prepared for a new foundry, construction work on which will commence this spring. It is the intention of the concern to have the new plant in operation by the fall of 1911.

Temple Malleable Iron & Steel Co., Philadelphia, recently incorporated, has taken over the plant of the Temple Ornamental & Structural Iron Co., at Temple, Pa., and has installed a malleablle castings equipment with 15 tons daily capacity.

Stockholders of the Inland Steel Co., Chicago, will meet, March 2, to vote on a proposed increase in the capital stock of probably $1,500,000. The present capital is $6,000,000.

RELIEF ASKED

From Alleged Unfair Rates by Coal and Coke Operators.

Two petitions have been filed with the interstate commerce commission, Washington, D. C., against railroads entering the Pittsburg district, asking for relief from alleged discriminatory freight rates charged coal and coke operators of that territory. The petitions were filed by Wade H. Ellis, representing John W. Boileau, Pittsburg, in his own behalf, coal shippers from the Pittsburg district to the great lakes and the Coke Producers' Association of the Connellsville region.

The petition of the Coke Producers' Association shows a list of freight rates on coke from the Connellsville region to various points of consumption for both furnace and foundry coke and charges that these rates are excessive, unreasonable and unjust; that they are in excess of the services rendered and yield a profit to the carrier much out of proportion to the cost of services; that the rates are unreasonable and unjustly discriminatory, when compared with rates for similar services on other lines of railways serving competing fields, and are unreasonable and unjust when compared with rates on other commodities exacted by defendants and other railroad companies; that these rates now in force are also "established and maintained by concerted action, mutual agreement and combination" between the defendants and the West Virginia companies. The complaint avers that the Connellsville region operators, "in selling their coke at said consuming or destination points, are obliged to compete with other producers in the Fairmont, Kanawha, New River and Pocahontas districts of West Virginia, and that the rates charged the operators of those districts are less than the rates charged the Connellsville operators by the defendant railways, and by the Chesapeake & Ohio and the Norfolk & Western railroads, serving said West Virginia districts."

The Brown Hoisting Machinery Co., Cleveland, has declared the usual 7 per cent dividend on preferred stock for the coming year. The next quarterly dividend of 1¼ per cent is payable April 1.

The firm of Joseph Nagusky & Co., Cleveland, having recently dissolved, Joseph Nagusky continues in the scrap iron business, with an office at 317 St. Clair avenue N. W.

U of M

Obituary

David Farquhar, who was connected with the Buffalo Pitts Co. for 30 years and was superintendent for that company, died Feb. 15 at his home in Buffalo, aged 63 years. He designed the road roller that became noted as the product of the Buffalo Pitts Co.

Robert Young, who with his brother, the late William Young, established the brass and iron foundry business of Young & Brother in Hamilton, Ont., died recently at his home in that city. He was born in Scotland 84 years ago and had resided in Hamilton for 56 years.

John Richardson, for many years connected with the Savage Mountain Fire Brick Co., Frostburg, Md., and the Clearfield Fire Brick Co., Clearfield, Pa., died, Feb. 3, at his home in Sewickley, Pa., of pneumonia, aged 80. Mr. Richardson had been highly regarded in the trade for the last two generations.

James E. Hubbert, formerly manager of sales for the Republic Iron & Steel Co. at Chicago and later at St. Louis, died Feb. 8, aged about 50. He was in the employ of the Republic company until about two years ago. He then engaged in the supply business in St. Louis, but the partnership was dissolved and he returned to Chicago.

Andrew Milliken, one of the founders of the Youngstown Car Mfg. Co., died unexpectedly, Feb. 19, at his home in Youngstown, O., aged 80. He was born at Harrisburg, Pa., passed most of his early life in Pittsburg, and in 1881 removed to Youngstown. In company with John P. Hazlett and B. F. Boyd, he organized the car building concern with shops at Haselton, O. He was actively interested in the management until some years ago, the company dissolving recently.

Richard C. Branch, vice president of the Branch Saw Works, St. Louis, died at the Minor hospital in Seattle, Wash., Feb. 17. Mr. Branch was on a business trip to the Pacific coast, and was taken ill with pneumonia. He was 40 years old, and the second son of the late Joseph W. Branch, who established the Branch Saw Works. The senior Branch also was president of the Jessops Steel Co. of England. Richard C. Branch was born in Dorchester, Eng., in 1871, while his parents were visiting at the time. He had managed the saw works since his father's death.

Charles E. Van Court, who had been identified with the Mark Mfg. Co., Chicago, for many years, died unexpectedly, Feb. 13, at West Baden Springs, Ind., where he had gone on account of ill health. Mr. Van Court advised his company that he was greatly improved in health and that Monday night and several hours later was endeavoring to close a window in his room on account of a violent electric storm, when in some manner he fell to the ground, a distance of four stories. Both legs and both arms were broken, but as he did not appear to have any internal injury, the physicians seemed to think he might recover. Five or six hours after the accident, however, he became unconscious and died in a few minutes.

Death of Wm. K. Fleming

William Kennedy Fleming, who for the past 11 years had been private secretary to Chairman E. H. Gary, of the board of directors of the United States Steel Corporation, died Friday afternoon, Feb. 17, at the Edgemere hotel, East Orange, N. J., of pleuro pneumonia. Mr. Fleming's illness was of but six days' duration, as he was at his desk the Saturday preceding his death. Though the attack was most severe from its inception, hopes for a recovery were entertained up to the last. Mr. Fleming, in the performance of his duties, had regularly come in contact with the leading iron and steel makers of the country and he was well known throughout the trade as an able and courteous assistant to Judge Gary. Mr. Fleming was 47 years of age and was a native of Brantford, Can. He held a degree from Harvard University. He is survived by a wife and two sons. Short funeral serices were held at East Orange, Feb. 18, and the body was then taken to Carlisle, Pa., for interment.

William K. Fleming

No individual photograph of Mr. Fleming is known to exist, owing to his extreme dislike of publicity, and the above was taken from a photograph of American Iron and Steel Institute banqueters at Pittsburg last fall.

Personal

John A. Topping, chairman of the Republic Iron & Steel Co., has gone to Florida for several weeks' vacation.

Chas. M. Schwab, president of the Bethlehem Steel Corporation, has returned from a several months' trip in Europe.

W. H. Fitzpatrick Jr., for the past several years associated with the Detroit Foundry Supply Co., has severed his connection with that concern and is now representing the S. Obermayer Co., of Cincinnati, Chicago and Pittsburg.

H. K. Devereux, of Cleveland, has been elected a director of the Railway Steel Spring Co. to take the place of the late J. E. French; G. B. Motheral, to succeed P. N. French, and Charles Scott Jr., to take the place of George G. McMurtry.

E. F. Lake, Avenue B and Forty-seventh street, Bayonne, N. J., announces that having severed his connections with *The American Machinist* as steel editor, he will act hereafter as special correspondent and consulting metallurgist. Expert advice will be given on melting, alloying, welding, etc., testing tool materials and shop equipment.

George Williams has been appointed superintendent of the Pierce Motor Co., the automobile branch of the J. I. Case Threshing Machine Co., of Racine, Wis. He succeeds Andrew J. Pierce, designer of engines, who has retired from active business. Mr. Williams was formerly associated with the Willys-Overland Co., of Indianapolis.

Sterling H. Bunnell, M. E., works manager of the Griscom-Spencer Co., has resigned to open an office at 90 West street, New York, as a specialist in factory system and consulting engineer. Mr. Bunnell is the author of "Cost Accounting for Manufacturing Plants", now in press by D. Appleton & Co., as one of their "Business Series".

The Edwards Mfg. Co., Cincinnati, sheet metal manufacturer, has installed a traffic department, owing to its largely increasing business. It has secured the services of J. H. Blanton as traffic manager. He was formerly connected with the Louisville & Nashville Terminal railroad and the Nashville, Chattanooga & St. Louis railroad, at Nashville, Tenn.

Monday, banks and markets were closed because of observance of Lincoln's birthday anniversary; foreign stock markets were firm and higher. House of congress decided by vote of 197 to 120 immediately to consider Canadian reciprocity measure, 101 negative votes being cast by Republicans. Tuesday closed dull and heavy at slight declines; cotton closed one-fourth cents a pound lower and wheat also declined; Southern Pacific authorized sale of $50,000,000 4 per cent bonds, New York Central authorized sale of $30,000,000 4½ per cent three-year notes, and B. & O. sold $10,000,000 4½ per cent two-year notes to care for similar maturing issue; House at Washington passed Canadian reciprocity bill, 221 to 92; investigation of "copper trust" demanded in resolution, introduced in Senate. Wednesday, Missouri Pacific was center of excitement, but statement of George J. Gould that he will retire as president, brought reaction, it being understood that this ends the Gould railroad regime; rest of market was dull and prices closed lower. A violent break in prices occurred Thursday; Bank of England reduced its discount rate to 3½ per cent; commodity prices were weaker. Friday, stocks were inactive, but closed firm and higher; exports of copper fell off heavily; wheat was lower and cotton weaker; foreign markets were lower on reported complications between Germany and Great Britain and between Russia and China. Saturday, the markets ruled active and stronger, closing at the best prices of the day; Imperial Bank of Germany reduced its discount rate from 4½ to 4 per cent.

Call money ruled from 2½ to 2 per cent; time money grew distinctly easier and was offered freely. Actual conditions of clearing house banks were: Loans decreased $4,798,600; deposits decreased $1,049,400; reserve increased $3,610,300; surplus increased $3,869,275; and the percentage of reserve is now 27.9, compared with 27.6 a week ago. Non-member banks and trust companies reported: Loans increased $12,236,600; net deposits increased $10,295,200; and the percentage of reserve, 17.4, compared with 17.5 the preceding week. Bank clearings showed a decrease of 9 per cent from the preceding week and of more than 20 per cent from last year.

	Closing Quo. Feb. 18	Changes in week	Annual Meeting late 1911		Stock Outstanding	Basis	Dividend Last Dividend	Dividend Date Last Div. Pay.
Allis-Chalmers	7⅞	— ⅛			$19,820,000			
Allis-Chalmers, pr	32	— ½	Nov.	2	16,150,000	7 cum.	1¾ Q.	Feb., 1904
American Can	9½	— ¼	Feb.	1	41,233,300		1¾ Q.	
American Can, pr	81⅓	— ½			41,233,300	7 cum.	1¼ Q.	Jan., 1911
Am. Car & Fdy	56¼	— ½	June	29	30,000,000		½ Q.	Jan., 1911
Am. Car & Fdy., pr	118½	+ ½			30,000,000	n. c.	1¾ Q.	Jan., 1911
American Loc	41¼	— ¼	Oct.	17	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	110	.....			25,000,000	7 cum.	1¾ Q.	Jan., 1911
American Ship	77½	— ¼	Oct.	11	7,600,000	4	1 Q.	Sept., 1910
American Ship, pr	111⅝	.....			7,900,000	7 cum.	1¾ Q.	Jan., 1911
Am. Steel Foundri s	49½	—1	Dec.	7	17,184,000		1¼ Q.	Feb., 1911
Barney & Smith	20	.....	June	6	2,000,000	4	1 Q.	June, 1908
Barney & Smith, pr	85	.....			2,500,000	8 cum.	2 Q.	Dec., 1910
Bethlehem Steel	32¾	— ⅜	April	4	14,862,000			
Bethlehem Steel, pr	63½	+1¼			14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	48¼	+2¾	Mar.	21	45,000,000	5	1¼ Q.	Feb., 1911
Cambria Iron	45⅛	— ⅛			8,468,000*	4	2 S. A.	Oct., 1910
Chicago Pneumatic Tool	50½	+1½	Feb.	20	6,485,800	4	1 Q.	Jan., 1911
Colorado Fuel	33¾	—1⅛	Oct.	16	34,235,500		1¾ Q.	Apr., 1902
Crucible Steel	133	+ ½	Oct.	18	24,578,400		3½.	
Crucible Steel, pr	81¾	+1¾			24,463,500	7 cum.	1¾ Q.	Dec., 1910
Empire Steel	5	.....	Feb.	22	1,254,770			
Empire Steel, pr	55	.....			2,503,000	6 cum.	2 S. A.	Jan., 1911
Fay & Egan	70	.....	Feb.	21	1,000,000	6 cum.	3 S. A.	Feb., 1909
Fay & Egan, pr	110	.....			1,000,000	7 cum.	1¾ Q.	Feb., 1911
General Electric	153½	—2	May	9	65,179,600	8	2 Q.	Apr., 1911
Harbison-Walker	40½	+4½	Jan.	16	18,000,000		½ Q.	Nov., 1911
Harbison-Walker, pr	95	.....			9,600,000	6 cum.	1½.	Jan., 1911
International Pump	43½	— ½	Dec.	12	17,762,500		1 Q.	Nov., 1910
International Pump, pr	88	— ⅞			11,350,000	6 cum.	1½ Q.	Feb., 1911
Lackawanna Steel	38	—2	Mar.	8	34,978,000			
Lake Sup. Corp	30	— ½	Oct.	4	40,000,000			
New York Air Brake	72	—1	Mar.	8	10,000,000	8	1½ Q.	Jan., 1911
Niles-Bement-Pond	94	.....	Feb.	8	8,500,000	6	1½ Q.	Mar., 1911
Niles-Bement-Pond, pr	104	.....			2,000,000	6 cum.	1½ Q.	Mar., 1911
Otis Elevator Co	59	+7	Mar.	20	6,375,000	3	1½ S. A.	Oct., 1910
Otis Elevator Co., pr	97	+1			6,310,000	6 n. c.	1½ Q.	Jan., 1911
Pa. Steel	60	.....	May	8	10,750,000			
Pa. Steel, pr	106½	.....			16,500,000	7 n. c.	3½ S. A.	Nov., 1910
Pittsburg Coal Co	20½	— ¾	Feb.	10	28,104,600			
Pittsburg Coal Co., pr	70½	—1¾			27,071,800	7 cum.	1¼ Q.	Jan., 1911
Pressed Steel Car	35¾	— ¼	Feb.	15	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	98⅞	.....			12,500,000	7 n. c.	1¾ Q.	Feb., 1911
Pullman	161	.....	Nov.	8	120,000,000	8	2 Q.	Feb., 1911
Railway Stl. Spring	36	—1	Mar.	2	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	99	+ ½			13,500,000	7 cum.	1¾ Q.	Dec., 1910
Rep. Iron & Steel	34½	— ¾	Oct.	18	27,191,000			
Rep. Iron & Steel, pr	98⅞	— ⅜			25,000,000	7 cum.	1¾ Q.	Apr., 1911
Sloss-Sheffield	53¾	—1½	Mar.	15	10,000,000	5	1¼ Q.	Sept., 1910
Sloss-Sheffield, pr	112	— ½			6,700,000	7 n. c.	1¾ Q.	Jan., 1911
U. S. Pipe & Fdy. Co	18	.....	June	28	12,106,300	2	1 Q.	Dec., 1910
U. S. Pipe & Fdy. Co., pr	57⅛	+1⅝			12,106,300	7 n. c.	1¾ Q.	Mar., 1911
U. S. Steel	80⅞	— ⅜	April	17	508,302,500	5	1¼ Q.	Mar., 1911
U. S. Steel, pr	119¾	+ ⅜			360,281,100	7 cum.	1¾ Q.	Feb., 1911
U. S. Steel 5s	105⅛	— ¼			463,798,000	5		
Va. Iron, Coal & Coke	66	.....	Sept.	19	9,073,680		5. †	Oct., 1907
Westinghouse Electric	70	.....	July	26	3,998,700*		5¼ Q. **	Jan., 1911
Westinghouse Air Brake	144	— ¾	Oct.	3	13,750,000*		5 Q. ‡	Jan., 1911

Par value of shares, $100, except those starred (*), $50.
**Includes 3½ per cent on back dividends.
†Stock.
‡Includes 1½ extra and 1 special.

Commercial failures for the week were 252, compared with 276 the preceding week, and 267 the corresponding week last year. Shares were dealt in to the number of 2,155,550, compared with 2,521,800 the preceding week, and 4,181,400 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $13,098,000, compared with $15,346,000 the preceding week and $16,417,000 the corresponding week last year.

Copper Stocks.

New York. — Amalgamated Copper closed 65¼, a net loss of ¾.

Boston.—Butte Coalition closed 19, unchanged; Calumet & Arizona closed 51½, a net loss of 2; Calumet & Hecla closed 505, a net loss of 20; North Butte closed 29, a net loss of ⅞; Quincy Mining closed 67, a net loss of 1.

Financial Notes.

The Republic Iron & Steel Co. has declared the usual quarterly dividend on preferred stock of 1¾ per cent, payable April 1.

Harbison-Walker Refractories Co., Pittsburg, has declared the usual quarterly dividend of one-half of 1 per cent on the common stock, payable March 1.

THE IRON TRADE REVIEW

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

February	5,703
March	5,754
April	5,793
May	5,827
June	5,842
July	5,864
August	5,875
September	5,895
October	5,955
November	5,993
December	6,026
January, 1911	6,058

February 23, 1911

Our Foreign Commerce

The full statistics of our foreign commerce in iron and steel in 1910 afford much food for reflection. Some of the totals are eminently satisfactory, others are not distinctly unsatisfactory, while others should incite inquiry as to what is amiss.

The record of our tonnage exports, made up chiefly of rolled iron and steel lines and their direct products, is eminently satisfactory. The total broke the best previous record by a trifle over 15 per cent, the 1,535,698 gross tons being 209,958 tons in excess of the 1,325,740 tons exported in 1906, hitherto our record calendar year for iron and steel exports. Full details of these exports were given in our issue of a week ago. The totals are made up of scrap, pig iron, unfinished steel, rolled iron and steel, wire products, pipes and fittings, etc.

The value of these exports was still more satisfactory than the tonnage, being $63,276,714 in 1910, against $52,215,089 in 1906, a gain of 21 per cent in value, while the gain in tonnage was only a trifle over 15 per cent. That does not necessarily indicate that higher prices were received in 1910 than in 1906, for the distribution of the exports as to degree of finish must be considered. In the past ten years there has been, on the whole, a progression toward exporting material in more finished form; but between 1906 and 1910 there was not much difference. Pig iron and scrap exports increased somewhat, while billets, sheet bars, etc., decreased very materially, rails in turn increasing. On the whole, there is reason to believe that prices received for similar products were slightly higher in 1910 than in 1906.

Unquestionably it is gratifying to observe our tonnage exports in a year gaining 15 per cent in weight and 21 per cent in value over the best previous year; but the incident that the best previous year in question was four years earlier reduces very materially the excellence of the showing. It is not much for the American iron trade to gain 15 per cent in four years, along any line of endeavor. Our famous rule of doubling pig iron production every ten years, for instance, involves an average increase of 32 per cent in each four-year period. However, in its entirely the record of our tonnage exports may be considered satisfactory. In the following table there are shown the total tonnage exports and the value thereof, for the past 13 years:

	Gross tons.	Value.
1898	901,427	$18,095,244
1899	942,689	25,162,220
1900	1,154,284	42,518,072
1901	700,857	29,050,446
1902	372,398	20,996,450
1903	326,590	20,452,839
1904	1,167,710	42,551,109
1905	1,010,255	42,104,348
1906	1,325,740	52,215,089
1907	1,301,979	60,046,221
1908	964,242	43,397,323
1909	1,243,462	50,783,138
1910	1,535,698	63,276,714

The average degree of finish of our exports is shown in a measure by the average value per ton; this was $41 in 1910, against only $20 in 1898. In the earlier year the chief exports were pig iron and rails.

The record of our iron and steel exports aside from the tonnage lines is much less satisfactory. They include everything that could be considered iron and steel, beyond the tonnage lines, with the exception of agricultural implements, which are separately stated. The exports of the non-tonnage lines in 1910 were valued at $137,995,189, which with $63,276,714 makes $201,271,903, the amount which the government statistics give as our total exports of iron and steel in 1910, not including iron ore. The exports of agricultural implements amounted to $31,291,351, making a grand total of $232,563,254.

The value of non-tonnage exports, $137,995,189, makes a new record, it is true, but by a margin of only $974,629. In the case of the non-tonnage lines, the best previous year was 1907. Such a showing cannot be regarded as satisfactory. In 1898 the value of the non-tonnage exports was $64,676,306, and the gain to $137,020,560 in 1907 represented a doubling, with a little to spare, in nine years. Why has this movement stopped? Domestic trade conditions were eminently satisfactory in 1907, while in 1910 they were, if not absolutely unsatisfactory, at least not as good as in a number of previous years. There should have been a particular incentive to export our manufactured goods in 1910, and doubtless the incentive existed. The difficulty presumably was that there were barriers which prevented the incentive bearing fruit to the extent one would expect.

Before scrutinizing the details of these non-tonnage exports, we give

the record for the past 13 years, the figures representing the value of the non-tonnage lines, i. e., all regular iron and steel exports outside of the tonnage lines, the value of which is given in the preceding table:

1898	$64,676,306
1899	80,526,857
1900	87,115,408
1901	73,484,129
1902	76,895,586
1903	78,583,026
1904	86,002,504
1905	100,824,165
1906	120,340,499
1907	137,020,560
1908	107,715,791
1909	106,897,193
1910	137,995,189

The small exports in 1908 and 1909, when domestic trade was not overly good, evidently indicate that exports depend more upon the receptiveness of foreign markets than upon the existence of surplus product or surplus capacity in our industries. Nevertheless, after three years of trade less satisfactory than that of 1907 it would be expected that means would have been found for more greatly increasing our exports. A glance at the details of exports shows at least where many losses occurred. The heaviest losses in 1910, as compared with 1907, were in the following lines:

	Exports in 1910.	Loss from 1907.
Electrical machinery	$7,156,688	$2,578,542
Metal working machinery	7,636,659	2,506,176
Locomotives	2,820,352	6,259,985

These are large losses, and that in locomotives is positively startling. Here are three lines, the exports of which in 1907 amounted to about $30,000,000, and which lost more than $11,000,000, or nearly 40 per cent. It may be interesting to trace locomotive exports in detail:

1900	$4,468,527
1901	4,051,434
1902	3,966,007
1903	3,099,521
1904	4,697,340
1905	5,573,080
1906	7,430,277
1907	9,080,337
1908	6,319,309
1909	2,829,256
1910	2,820,352

Except that exports were fairly large in 1908, the swing in locomotive exports was much the same in kind if not in degree as the swing of purchases of rolling stock by American railroads. If it is public unrest in the United States which has destroyed the borrowing and purchasing power of American railroads, what is the matter with foreign railroads that our locomotive manufacturers cannot sell to them at a time when they must be particularly anxious to obtain export business?

Inasmuch as total non-tonnage exports did show an increase in 1910 over 1907, there were necessarily gains in some lines to make up for the losses in electrical machinery, metal working machinery and locomotives as shown as above, beside a number of minor losses to which we do not refer in detail. These gains as a rule were slight and well distributed. Many of them were in general classes, not specifically returned in the government statistics. One striking gain, however, was that in typewriters, from $6,664,000 in 1907 to $8,848,000 in 1910, a gain of $2,184,000 or nearly one-third.

The Iron and Steel Outlook

Seven weeks of the new year have furnished a period long enough to develop some definite trends and indications as to the character of the year in the iron and steel industry. These are all satisfactory. If the present year keeps up this gait as well as 1910 kept up its early gait, the results of the year are going to be very good. When 1910 opened, the trade was practically at its best. Buying had been heavy and prices had been advancing. It is true the high point was not precisely at the beginning of the year. Pig iron prices had already started to move off slightly, while pig iron production did not reach its maximum until February. However, the general statement can be made that the best part of 1910 was at its very beginning, and that throughout the year conditions grew worse.

The year 1911 has already scored some material improvements. The trade has gotten quite used to testing the market condition by the three measures, prices, bookings and production. By each measure there has been an improvement. In finished steel products, there have been two advances, one of a dollar a ton in wire products, effective Jan. 23, and one of 10 cents a box in tin plates, effective Feb. 4. These advances did not represent any general advancing tendency in steel products, each being due to special conditions, but they were of general import just the same, because they showed that if certain special conditions called for advances, the market was capable of making them. That is something which a considerable portion of the trade at the beginning of the year did not consider possible. In such quarters there was evidently a conviction that whatever steel prices did they would not advance. Other steel products are absolutely firm in price. They were practically so in December, but the fact was not admitted. Now the tests have been so general that there is no room for question.

The second measure, that of bookings, also furnishes a favorable showing. The conspicuous instance is of course the record of the United States Steel Corporation. Its report, made public last Friday, showed unfilled orders on Jan. 31 of 3,110,919 tons, which was a gain of 436,162 tons during January. In 1910, its bookings suffered a total loss of 3,252,274 tons, the average monthly loss during the first half of 1910 being 278,206 tons and in the second half 263,840 tons, with a maximum in the second half of 433,803 tons, in August. Thus there was a very sharp turn in the tide in January. This has been presaged by the monthly losses becoming smaller and smaller towards the close of last year, the December loss being only 85,656 tons.

The gain of 436,162 tons in January in Steel Corporation bookings was approximately 36 per cent of its capacity, the capacity being usually taken at about 1,200,000 tons monthly. Thus, whatever its production may have been, in percentage of capacity, its bookings were 36 points greater.

The tonnage of steel orders is well distributed among the various producers at this time, and there is no suspicion that the Steel Corporation has been getting more than its share, so that the bookings in the industry as a whole may be taken to have increased very materially. Special aid was given to the Jan. 31 showing by the book-

ings in rails and wire products, but these gains are not over. A number of rail tonnages have been practically closed lately, without the tonnages being definitely entered on the books, and there should be large entries this month. As to wire, the advance in price was effective Jan. 23, and the advance greatly stimulated specifications. That stimulus, having existed for only eight business days in January, prevails this month also.

Production has sharply increased. The merchant furnaces cannot be accused of blowing in when the state of order books does not warrant, and the gain in blast furnace operations is directly attributable to increased activity at steel works. Our blast furnace reports have shown the following total number of coke and anthracite furnaces in blast:

Oct. 31	230
Nov. 30	218
Dec. 31	193
Jan. 31	210

The January gain was large, 17 furnaces, and almost equal to the December loss. In this, as in the other measures, the important feature is the change in direction. In 1910, from February until the close of the year, the trend in production was uniformly downward.

There has been every reason to assume, during the past few months, that activity in the iron trade was swinging too far downward. When the downward swing would be arrested, no one could say, for it is the custom of the industry to overdo its movements, passing the normal frequently at top speed in either direction, and finally reacting when far above or below normal. Given only fair general industrial and financial conditions, the iron industry was below normal in the closing months of last year, and all that was needed was for it to get around the turn. That it has done, and it should not be difficult for it to reach, by gradations, a plane of much greater activity.

The rate of recovery in January should not be taken as the measure of the promise for the remainder of the half year or year. The industry is more likely to recover by steps than by passing up an incline. Already in February there are signs of practically stationary conditions and the month may show little concrete recovery, although the general tone in the market seems to be improving. Next month or month after, another sharp improvement is likely to come, and by the time the half year is ended a large part of the ground lost in 1910 is likely to have been retraced.

PRESSED STEEL CAR CO.

Presented Report for 1910 at Recent Annual Meeting.

The annual meeting of the Pressed Steel Car Co. was held in Jersey City, Feb. 11, when the following directors were re-elected: James H. Reed, T. H. Given, James N. Wallace, F. N. Hoffstot, C. W. Friend, Adrian H. Larkin, James A. Blair, A. S. Matheson and O. C. Gayley. The board reorganized and re-elected the old officers as follows: President, F. N. Hoffstot; vice president, O. C. Gayley; secretary, Adrian H. Larkin; assistant secretary, J. H. Regan; treasurer, E. P. Van Horne; auditor, W. A. Chamberlin; general manager, J. B. Rider; purchasing agent, H. J. Gearhart. The income account for the year ended Dec. 31, 1910, follows:

Earnings from operations	$2,043,651		
Net earnings	1,697,496		
Other income	150,870		
Net income	1,848,366	Dec.	$106,217
Depreciation and rentals	280,000	Inc.	160,000
Balance for dividends	1,568,366	Dec.	266,217
Preferred dividends	875,000	Unchanged	
Surplus	693,366	Dec.	266,217
Previous surplus	6,653,640	Inc.	939,583
P. and L. surplus	7,347,006	Inc.	693,368

A reserve fund for contingencies of $800,000, of which $21,940 was added last year, is held by the company.

President Hoffstot in his remarks to stockholders, in regard to the company's prospects, says:

The usual policy to develop improved methods and facilities for the economic manufacture of cars has been continued and with the interest account on the right side of the ledger, and no mortgage indebtedness, the company is in position to build cars at the lowest costs, and, therefore, should receive its full share of the business when cars are offered. It is, however, quite difficult to predict the business prospects for the year 1911. There were at the opening of the year a number of inquiries, but the competition for business is keen, particularly as manufacturers are actuated by a desire to hold their organizations together in the hopes of a permanent improvement in business, well knowing from past experience how expensive it is to assemble a competent operating force after it has once been scattered. There were about 25 per cent less cars ordered in 1910 than in 1909, and even the orders placed during 1909 were much less than the average annual rated car requirements. In addition there has been a contraction in the efficiency of car equipment, due largely to idleness, but in some cases failure in up-keep, and it is therefore reasonable to expect an average (and perhaps increased) volume of business will be offered during the year 1911, unless some further business disturbance occurs. The labor conditions as a whole have been satisfactory.

During the year $304,301 was spent in improvements, divided between the McKees Rocks and Allegheny works. Plants are in good condition. Plant of Western Steel Car & Foundry Co., all the stock of which is owned by the company, was operated almost continuously. Close inventory shows material on hand of greater value than shown on the balance sheet. Seven patents have been granted the company, 18 are pending and nine are in course of preparation. The company owns 156 patents in the United States and 69 in Canada. The passenger car department turned out 100 per cent more business than in 1909. Gross sales for the year totaled $27,975,978, against $10,346,816 in 1909.

PROGRAM PLANNED

For Triple Meeting Machinery Associations at Louisville.

Announcement is made of the tentative program now under consideration for the triple joint convention of the Southern Supply & Machinery Dealers' Association, the National Supply & Machinery Dealers' Association, and the American Supply & Machinery Manufacturers' Association, to be held at Louisville, Ky., April 3, 4 and 5. In a general way, the program indicates the arrangements made for that occasion and is as follows:

Monday, April 3:

Opening joint session; addresses of welcome; responses by the presidents of the three associations followed by impromptu addresses.

Separate executive sessions of the three associations.

Vaudeville entertainment for the ladies.

Reception to the officers of the three associations, followed by dancing, cards and refreshments.

Tuesday, April 4:

Separate executive sessions of the three associations.

Automobile ride for the ladies.

Luncheon for the ladies at the Country club; cards, golf, tennis, bowling, etc.

Supper a la German, and smoker with vaudeville, in the Seelbach hotel.

Wednesday, April 5:

Separate executive sessions of the three associations; to be followed, if business permits, by a joint session for installation of officers; otherwise, joint session for installation of officers at 3 p. m.

River outing for the ladies, with luncheon on boat.

Matinee party.

Impromptu.

Thursday, April 6:

Excursion to Mammoth Cave, leaving Louisville about 7:30 a. m., arriving at the cave about 10:30 a. m., and leaving at 3 p. m. if desired to catch evening train from Louisville.

LIVE MACHINERY NEWS

The machinery trade displayed a marked improvement last week. Reports from the leading centers indicated an increasing number of small sales and a larger number of new inquiries. In eastern territory, no action has yet been taken on the large lists submitted by the New York, Ontario & Western and the New York, New Haven & Hartford railroads, although some other lists have been completed. Chief of these is a list of between 50 and 60 machine tools for the new plant of the Simms Magneto Co., Watsessing, N. J. A number of projects in New York territory, which have been held in abeyance since the early part of last fall, are also about to be revived. In Pittsburg, a large amount of new construction work will soon be under way. The Jones & Laughlin Steel Co. has authorized the building of 12 new tin mills at Aliquippa, Pa., and another independent concern in that vicinity is considering plans for the building of six additional tin mills. In the middle west, railroads have been buying somewhat more freely, although in small lots only. The Lake Shore & Michigan Southern railway has not yet issued the list for its Elkhart, Ind., shops.

Railroads

It is reported that the Louisville & Nashville railroad, W. H. Courtenay, chief engineer, Louisville, Ky., intends to erect a track repair plant at Evansville, Ind., to cost about $140,000.

A turntable is to be constructed at Maysville, Ky., by the Chesapeake & Ohio railroad at a cost of $10,000. F. I. Cabell, chief engineer maintenance of way, Richmond, Va., is in charge of the construction.

Machine Tools

The Northern Equipment Co., 416 West Indiana street, Chicago, is in the market for one 4-spindle gang drill press, one tool maker's lathe, one internal grinder, one precision lathe and possibly some additional machine tools for its plant.

The Simms Magneto Co. has issued a list of between 50 and 60 machine tools for its new plant at Watsessing, N. J. A number of turret lathes, drills and light milling machines are included. The list is estimated to involve about $30,000.

Iron and Steel Works

The Gray Iron & Steel Co., Tacoma, is planning a large addition to its present plant on Chambers creek and has ordered a converter with which to manufacture steel. About $50,000 will be spent on improvements to the plant.

A large amount of machinery will be required in connection with the new steel works to be built at Midland, Pa., by the Crucible Steel Co. of America, and bids for some of the equipment will probably be invited within the next few months, although it has not been decided what amount of the proposed new work will be undertaken this year.

President E. W. Crellin, of the Des Moines Bridge & Iron Co., announces that the company has purchased another 11-acre tract of land on Neville Island, near Pittsburg, on which the proposed extensions to the Pittsburg plant, as announced recently, will be made. On the channel side of the island the company has begun the new business of steel barge building and is now building steel barges for the government. President Crellin announces that the capacity of the Pittsburg plant will be doubled. The general offices of the company will be removed from Des Moines to Pittsburg.

The Inland Steel Co., Chicago, is completing plans for a bolt and nut department to be added to its Indiana Harbor plant. At first this department will have an output of 100 tons of track bolts, nuts, rivets and general machine bolts daily, but will be so designed that future extensions may be readily made. The new bolt and nut department will involve an expenditure of about $250,000. Part of the proposed increase of $1,500,000 in the capital stock of the Inland Steel Co. will be used to defray the cost of this improvement, together with that of the new blast furnace previously announced in THE IRON TRADE REVIEW.

Public Works

Emporia, Kas., expects to construct a $13,000 water works. Matthew Brown, Emporia, is engineer.

Silverton, Ore., has voted $75,000 worth of bonds for the construction of a water works system.

East Liverpool, O., is considering the construction of a water works system. The estimated cost is $175,000.

The Riggs & Sherman Co., Toledo, O., is preparing plans for the remodeling of the water works plant at Kenton, O.

The Pennsylvania Industrial Reform School, Huntingdon, Pa., is considering a number of improvements to its water works plant.

A committee of the village board, Peoria Heights, Ill., is now engaged in making investigation with a view toward establishing a municipal water works system.

The board of water works trustees, South Bend, Ind., will soon let contract for a pumping station at Portage Park and for installation of suction and air lift pumps.

Conway, Ark., has sold $68,000 worth of bonds for the construction of a water works system, including pumping station. Joseph McCoppen, Little Rock, Ark., was awarded the general contract.

Mayor George H. Lee of Hamilton, Ont., has asked for sealed tenders for installing in the Beach pumping station, that city, five horizontal tubular boilers, 14 feet in diameter, including all accessories.

R. C. Houston, Memphis, Tenn., is preparing plans for a water works system to be constructed by Dyersburg, Tenn., for which a bond issue is to be authorized. The cost of the system will be $20,000.

The city of Marshalltown, Ia., is in the market for water wheels, pumps, etc., to cost about $12,000, for installation at the new dam which the city has constructed. B. J. Lambert of Iowa City, Ia., is consulting engineer.

Bids will be received by the board

of water commissioners, Ogdensburg, N. Y., James M. Wells, chairman, until Mar. 7, for pipe lines, steam and electrical pumping machinery, water turbine, electrical equipment, boilers, etc. Hazen & Whipple, consulting engineers, New York.

Buffalo intends to purchase equipment for its new pumping station. This will include five 30,000,000-gallon capacity triple expansion pumps; one electric overhead crane; eight 750-horsepower water tube boilers and steam mains; coal and ash handling machinery and feed pumps, together with all necessary appliances and attachments for the complete operation of the same.

New Works

The Toledo, O., Nickel Works has taken larger quarters at 17 St. Clair street, where the equipment will be increased.

John Rommel, Louisville, Ky., will build an automobile repair shop and will be in the market for equipment for it in the next few weeks.

The Griffin Wheel Works, Salt Lake City, Utah, has selected a 40-acre site in that city and will soon begin the erection of an extensive factory.

C. H. Morris, of the Halliday Auto Co., Streator, Ill., is in Winnipeg making arrangements for the establishment of a branch factory there.

The Buffalo Bolt Co., Tonawanda, N. Y., is planning to build an addition to its plant and install equipment giving employment to 200 additional hands.

Bids are going in on the equipment for the new plant to be erected at Trafford City, Pa., by the Linde Air Products Co., plans for which were announced recently.

The Bradrick Power Pump Co., Porterville, Cal., has announced its intention of moving to Los Angeles, where it will erect shops at Central avenue and Twentieth street.

It is reported that the Odee Gas Engine Co., Beloit, Wis., is contemplating the construction of a plant at Memphis, Tenn. A subsidiary company will probably be organized with a capital of $100,000.

The Standard Sanitary Mfg. Co., Pittsburg, is making plans for establishing a branch plant in Toledo, O., and taking over the plant and business of the J. F. Grosweiler Co. and the Ohio Plumbers' Supply Co.

The Siler-Pettitt Mfg. Co., Fort Wayne, Ind., has been incorporated with a capital of $250,000 to establish and equip a plant for the manufacture of pumps. E. E. Siler, B. F. Pettitt and G. S. Sanford are directors.

The Nye Gas Machine Co., La Porte, Ind., has been incorporated by J. I. Nye, C. F. Peterson and H. B. Johnston with a capital of $75,000 for the purpose of manufacturing gas engines and appliances.

The transfer of the property of the New Albany, Ind., Woolen Mills Co. to the American Automobile Mfg. Co., has been completed. The plant is to be used for the manufacture of motor cars, and machinery is now being installed.

The Drop Forge Mfg. Co., New Westminster, B. C., B. F. Boyd, representative, is preparing plans for the erection of a forge and factory addition to its present plant for the manufacture of tools. The buildings and equipment will cost over $125,000.

The directors of the Gorham Engineering Co., Alameda, Cal., have announced their intention of erecting another gas engine factory on a site recently purchased. The building will cost $20,000 and machinery will be installed to the amount of $80,000.

The J. I. Case Threshing Machine Co., Racine, Wis., has completed a large assembling shop and has under construction another building, 200 x 62 feet. A third building will be erected later. "Case" automobiles are to be manufactured in the new plant.

The Detroit Wheel Co., recently incorporated with $100,000, will soon begin the erection of a new factory in Detroit. A new type of automobile wheel will be made. Charles R. Chesholm, Adolphus Weir and Fred A. Sweitzer, all of Detroit, are interested.

Although final plans have not yet been approved, the Baird Machine Co., Oakville, Ct., is planning the erection of a new plant at Stratford, a suburb of Bridgeport, Ct. It is stated that the new plant will probably contain about 100,000 square feet of floor space.

The Raymond C. Agner Co., Burlington, Wis., incorporated for $30,000 to manufacture grease and oil guns, automobile parts and specialties and brass and metal goods, intends to erect a plant at Burlington this spring. The promoters are Raymond C. Agner, Hugh Agner and Edward C. Brook.

Eames & Young, architects, 1702 Wright building, St. Louis, Mo., have plans in progress for a factory and warehouse to be erected at Eighth and Spruce streets, St. Louis, by the Western Electric Co., of Chicago. The building will be five stories high, with basement, 100 x 125 feet, and will cost $100,000.

The Consolidated Gas, Electric Light & Power Co., Baltimore, Md., is reported to be preparing to spend about $300,000 in the construction and equipment of a large storage battery plant in that city. Of this sum about $250,000 will be spent for the equipment. Herbert Wagner is vice president of the company.

The Warner Motor Co., Toledo, O., capital $10,000, has been incorporated by Thomas W. Warner, W. Rexford Smith, F. Stanton Janney, Louis S. Stewart, Frank G. Burt and George D. Moore and will take over the business of the Warner Mfg. Co., which has been a private concern. The company manufactures automobile gears and is now located in one of the buildings of the Willys-Overland Automobile Co.

The Hartman Machine & Boiler Co., Green Bay, Wis., has awarded contracts for the construction of its new plant on the Fox river near Green Bay. The main building will be 60 x 60 feet, with provision for extension to 300 feet, and the boiler shop will be 80 x 80 feet. Brick and steel construction will be employed. The equipment will include one 25-ton and one 5-ton electric traveling crane, one 5-ton hand crane, and a 31,000-pound steam hammer.

The Positive Clutch & Pulley Works, Ltd., Toronto, has begun work on a three-story brick factory on Lansing street in Buffalo, in which will be installed a quantity of equipment for manufacturing clutches, pulleys, marine reverse gears, power and transmission appliances. S. Z. Benedict, who has an office in Ellicott Square, has been appointed resident manager. The officers of the firm are: President, Thomas Hook; vice president, Charles S. Hook; secretary and treasurer, Norman F. Beard.

Foundries

The Sanford-Day Iron Works, Knoxville, Tenn., which has been formed for the manufacture of stoves, is having a $30,000 plant constructed. Equipment will be purchased in the near future.

The Railway Brake Shoe Co., J. L. Cohagan, president, has prepared plans for a plant at Moundsville, W. Va. The plans include the following structures: A two-story mixing and press room, 50 x 120 feet; annealing room, two stories, 60 x 100 feet; and foundry, one-story, 80 x 100 feet.

The Washington Steel & Iron Co., Spokane, Wash., will shortly erect a

mill and foundry at either Leavenworth, Wash., or Dryden, Wash. The company bought a tract at the former place some time ago and was preparing to build the plant when Dryden offered a 60-acre tract gratis.

The Taylor & Boggis Foundry Co., Cleveland, which recently sold its East Fifty-fifth street and Euclid avenue property to the Pennsylvania railroad, has purchased a tract on East Fifty-fifth street at the crossing of the Erie railroad tracks, that city. Work will be begun immediately on plans for a new plant to include a foundry, power plant, etc. It is expected that the new plant will be ready for occupancy in the fall of 1911.

Power Plant Equipment

Big Sandy, Tenn., is planning the establishment of an electric light plant.

George A. Browning, Murphy, N. C., is interested in a project to construct a hydro-electric plant in that city.

The Tennessee legislature has passed a bill authorizig the city of Trenton to operate an electric light plant.

The school committee, David A. Ellis, chairman, Boston, Mass., is planning the erection of a $12,000 lighting plant.

Bids will be received at the office of the county auditor, Parkersburg, W. Va., for installing an electric light plant.

The Boone Co. Flour Mills, Petersburg, Ky., is asking for prices on a second-hand 25 to 40-horsepower gasoline engine.

The Nabring Brick & Tile Co., of Tullahoma, Tenn., is in the market for a new or second-hand engine of 30 horsepower.

Apple River, Ill., will receive bids until Mar. 1, for the construction of an electric light plant. Lester A. Varty is village clerk.

W. A. Von Berg, Mosinee, Wis., is interested in the construction of an electric light plant for Mosinee to cost about $4,000.

The American Tobacco Co. is planning the construction of a power house in Baltimore. Painter & Posey, that city, are the engineers.

The Union Light, Heat & Power Co., Covington, Ky., has been awarded a franchise by Dayton, Ky., a suburb, for furnishing electric light.

G. E. K. Hixson, Harrisburg, Ill., is reported interested in the construction of a power plant at the Grand Rapids dam near Mt. Carmel, Ill.

A gasoline engine to operate the heating plant of the Messick high school will be purchased by the county board of education at Memphis, Tenn.

The Hickman Ice & Coal Co., Hickman, Ky., plans the establishment of a lighting plant. A 60-cycle generator, direct current, of 100 kilowatt capacity, is to be purchased.

The Columbia, Ky., Lighting Co. will be in the market shortly for 60-kilowatt direct-current generator, as it plans changing its system from alternating to direct current.

The Bolte & Meyer Co., 8 East Michigan street, Chicago, is building a factory at 125 South Center avenue and will be in the market for three or four electric motors.

The board of public affairs, Arlington, O., is planning to install a return tubular, 72 x 16-foot boiler in the municipal lighting plant during 1911. R. E. Dillon is superintendent.

The trustees of the Sanitary District of Chicago are preparing proposals for the purchase of a transformer for the seventh unit to be established at Lockport, Ill.

Generating equipment will be purchased by the Home Light Co., Grayson, Ky., which is enlarging its plant. An 80-horsepower boiler will be purchased. J. A. Bagby is manager.

J. C. Emmick, Lewisport, Ky., has secured a lighting franchise from Lagrange, Ky., and will build a plant. It is to be in operation within 90 days, according to the plans which have been announced.

The Klamath Falls Light & Water Co. has secured a 50-year franchise from the city trustees of Klamath Falls, Ore., and will do a large amount of construction work, commencing at once.

An electric power plant for the operation of 4,300 ovens is to be constructed by the Elkhorn Consolidated Coal & Coke Co., which is planning the development of 2,500 acres of coke lands at Hellier, Ky.

Plans are being considered for the construction of a 3,500-horsepower, hydro-electric plant and a steam auxiliary plant at the Grand Rapids dam, Mt. Carmel, Ill. G. E. K. Hixson, Harrisburg, Ill., is interested.

The Nashville Electric Light Co., Nashville, Ill., K. A. Steinhauser, manager, proposes some improvements to its system which will involve the installation of 20 additional lights and the purchase of a steam turbine.

The Central Realty & Investment Co., 51 Jackson boulevard, Chicago, G. Grace, chief engineer, contemplates the installation of an electric passenger elevator, two electrically driven pumps and a low pressure boiler in the Chemical Bank building, Chicago.

The Idaho Realty & Power Co., of Grangeville, Id., has announced that it will commence work at once on the installation of a large power plant to supply the mines and surrounding towns with electric power and illumination.

The Joplin & Pittsburg Railway Co., Pittsburg, Kas., expects to purchase one 400-kilowatt generator, one 600-horsepower engine and one 150-horsepower boiler for its new power plant. William A. Satterlee, of Pittsburg, is purchasing agent.

Final plans for the new plant of the Kentucky Electric Co., Louisville, Ky., are being drawn up by Sargent & Lundy, Chicago, in conjunction with Lewis Streng, chief engineer of the company. It is expected that the company will be ready to receive bids within a few weeks.

Smith, Carey & Chace, consulting engineers, Winnipeg, Man., and Toronto, Ont., who have charge of the city power plant now being constructed at Point du Bois, near Winnipeg, state that additional machinery required for the completion of the work will cost $980,000.

The Dominion parliament has granted permission to the city of Prince Albert, Sask., to develop a water power north of the city to cost about $2,000,000. Contracts will probably be let soon by the city for a 600-kilowatt, direct connected, turbo-generator unit for the municipal electric light plant.

Resumption of work on a large hydro-electric plant at Whitney, N. C., by the Whitney Electric Development Co. is promised. This project was interrupted recently by the company's going into the hands of a receiver. C. V. Smith, one of the receivers, has opened offices preparatory to pushing the completion of the work.

Special committees of the Baraboo, Wis., common council have reported that an expenditure of $45,000 will be necessary to build a complete municipal electric light and power plant. The alternative is to lease current from the Southern Wisconsin Power Co., which has developed the Wisconsin river at Prairie du Sac. This would involve the erection of a substation.

The Westinghouse Electric & Mfg. Co., Pittsburg, has received a large order for electrical equipment from the Panama canal commission, including two 100-horsepower motor generators with switchboard control and complete outfit for work in con-

structing the great gates of the Gatun locks. A central station will supply the power for the plant with a current running at 2,300 volts.

The Washington Water Power Co., Spokane, Wash., has awarded a contract to the I. P. Morris Co., Philadelphia, for the construction of four large water wheels. The wheels are to develop 90,000 horsepower and will upon completion weigh over 1,000,000 pounds.

The Wilkes-Barre, Pa., Railroad Co. expects to purchase one 1,500-kilowatt, low pressure turbine; two 300-kilowatt rotary converters and condensing outfit; one 750-kilowatt, motor-generator set; four 500-kilowatt, rotary converters. Thomas A. Wright is general manager.

The Standard Oil Co. has placed a large order with the Westinghouse Electric & Mfg. Co. for the complete equipment of the power house of an oil refinery at Bayonne, N. J., including four generators, transformers, switchboards and a number of individual motors.

The United Water, Light & Traction Co. has been formed at Somerset, Ky., to take over the property of the Somerset Water, Light & Traction Co., which was sold at auction to wind up a receivership. It is stated that $50,000 will be spent in improvements, especially in connection with the power house of the traction system.

The Clinchfield Coal Corporation, which has headquarters at Bluefield, W. Va., is planning immense improvements in connection with its Kentucky-Virginia coal properties. An electric power plant to cost several hundred thousand dollars, a water works system the cost of which is estimated at $100,000, and the extension of the company's railroad are some of the improvements that are in contemplation.

Bids will be received at the office of the borough clerk, Coraopolis, Pa., until Mar. 1, for the following: One 1,500,000-gallon triplex pump; one 150-horsepower gas engine for driving pump; two 225-horsepower gas engines to be direct-connected to 175-kilo-volt-ampere, 2,300-volt, 60-cycle, three-phase, alternating current generators; one 75-horsepower gas engine to be direct-connected to 50-kilo-volt-ampere, 2,300-volt, 60-cycle, three-phase, alternating current generator; two 175-kilo-volt-ampere, 2,300-volt, 60-cycle, three-phase alternating current generators, complete with exciters; one 50-kilo-volt-ampere, 2,300-volt, 60-cycle, three-phase alternating current generator, complete with exciter. S. B. Martin is consulting engineer.

Miscellaneous

Bids are being received by the New York & Cleveland Gas Coal Co. for a one-story fan house to be built at the Delmont, Pa., mine.

Two hoisting engines will be purchased by Oliver King, Knoxville, Tenn., for use in the operation of marine ways, which are now being constructed.

The Hoppes Mfg. Co., Springfield, O., through its Pittsburg office, has received orders from A. M. Byers & Co., Pittsburg, for two large exhaust steam feed water heaters for the Robinson Clay Products Co.

General Manager A. W. Thompson, of the Baltimore & Ohio Railroad Co., is authority for the statement that the company will begin actual construction of the proposed new freight terminal at Wheeling, W. Va., to cost about $400,000, as soon as conditions warrant.

Glen H. Curtiss, the aviator, has purchased the factory buildings, machinery and equipment of the Herring-Curtiss Co., Hammondsport, N. Y., from G. H. Parkhurst, trustee in bankruptcy, for $18,418.75. Mr. Curtiss will reorganize the company and proceed with the business upon an enlarged scale. The factory will continue to make motors, motorcycles and aeroplanes.

Since Jan. 1, 1911, the Westinghouse Electric & Mfg. Co. has received orders for electric power apparatus, aggregating 150,000 horsepower, to be supplied to plants located in various parts of the country, notably one in Portland, Ore., and another in South Carolina. The demand for the equipment of power transmission plants, as well as for electric railway machinery, has included several big contracts. The Edison Electric Illuminating Co., Brooklyn, N. Y., is now being supplied by the East Pittsburg shops with a quantity of electric generating machinery. The railway department is working on a large order for electric locomotives recently placed by the Pennsylvania Railroad Co., delivery of which will be begun by July 1 of this year. The export department has booked a healthy volume of business.

Government News

Navy Supplies.

Bids opened at the bureau of supplies and accounts, navy department, Washington, Feb. 14, were as follows:

One set gasoline machinery, complete, except stern tubing, for commandant's barge: Clifton Motor Works, Cincinnati, $5,045; Murray & Tregutha Co., Boston, $4,480.80; New York Yacht & Engineering Co., New York, $5,300.

One Mosher marine, type A water-tube boiler, guaranteed to deliver not less than 200 horsepower: Alney Water-Tube Boiler Works, Providence, R. I., $2,170; Griscom-Spencer Co., New York, $2,197; Mosher Water-Tube Boiler Co., New York, $2,300; Charles Ward Engineering Works, Charlestown, W. Va., $2,750 and $2,500 (alternate bids on different quality product).

25,000 pounds manganese bronze ingots: Ajax Metals Co., Philadelphia, $111 and $112 per cwt.; Bethlehem Steel Co., South Bethlehem, $0.14 per pound; Central Metals & Supply Co., Baltimore, total price, $1,218; Exeter Machine Works, Pottstown, Pa., total, $1,115; George Washington Smelting & Refining Co., Chicago, total, $1,149; Nassau Smelting & Refining Works, New York, $112 and $128 per cwt.

3,950 pounds screw-box and breech-plug forgings for big guns: Midvale Steel Co., Philadelphia, $1,475; Carpenter Steel Co., New York, $1,090.50.

6,000 pounds galvanized steel angles, 1 inch by 1 inch by 3-16 inch, in commercial lengths; and 2,000 pounds steel channels, 1 inch by ⅜ inch by ⅛ inch, in commercial lengths: Carnegie Steel Co., Philadelphia, $227.40; Easton Supply Co., Easton, Pa., $252; Forment & Co., New York, $248.

Bids Invited.

Bids are invited as follows by the bureau of supplies and accounts, navy department, Washington, until March 7:

30,000 steel grommets for delivery at Brooklyn, schedule 3364; 48 steam gages, Norfolk, schedule 3363; miscellaneous chain blocks and hoists, Norfolk, schedule 3361; miscellaneous squirt cans, Boston, schedule 3361; 450 pounds sheet brass, Boston, schedule 3362; 1,436 pounds sheet copper, Boston, schedule 3362; 7,500 pounds steel forgings, oston, schedule 3362; 12,500 pounds wrought iron, Annapolis, schedule 3362; 12,800 pounds bar steel, Annapolis, schedule 3362; 5,300 pounds corrugated galvanized steel, Annapolis, schedule 3362; 3,600 pounds machine steel, Annapolis, schedule 3362; 20,500 pounds structural steel, Annapolis, schedule 3362; 4,700 pounds structural steel plates, Annapolis, schedule 3362; miscellaneous brass cocks, Norfolk, schedule 3363; miscellaneous brass pipe fittings, Norfolk, schedule 3363; miscellaneous iron pipe fittings, Boston, schedule 3356; 720 one-quarter inch brass unions, Norfolk, schedule 3363; miscellaneous brass valves, Norfolk, schedule 3363; miscellaneous drip-valves, Boston, schedule 3356; miscellaneous brass gate-valves, Norfolk, schedule 3363.

Until March 21:

Two turbo-generator sets for delivery at Mare Island, Cal., schedule 3355.

TAKES OVER WORKS.

The Valley Iron Works, Williamsport, Pa., has taken over the Morris Machine Works, Baldwinsville, N. Y., which has been manufacturing the Hendershot patent compression shaft coupling. The Valley concern has been a steady buyer of the coupling and will remove the plant to Williamsport within the next month, occupying a recently constructed addition to the Valley plant.

The Warwick Iron & Steel Co. has given notice that it will exercise the option of paying off on June 1 all of its $300,000 first mortgage 5 per cent bonds at the office of a Philadelphia trust company.

A steel and brick church calling for fair tonnage will be erected by Rt. Rev. Monsignor Nelson H. Baker in Lackawanna City, N. Y. The plans have not been completed.

The Empire Plow Co., Cleveland, has reduced its capital from $350,000 to $210,000.

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers:—

The following manufacturing concerns have been incorporated:

The Acme Foundry Co., Indianapolis; $10,000; by J. M. Haines, E. T. Taylor and J. L. Hall.

The Red River Metal Co., Winnipeg, capital $40,000; chief incorporators, W. H. Irwin, F. G. Irwin and I. W. Dafoe.

Ross Motor Car Co., Ltd., Toronto, capital $40,000; provisional directors, Wm. J. Ross, Gordon N. Shaver and Robert B. Law.

The Gravenhurst Hardware Co., Ltd., Gravenhurst, Ont.; capital $20,000; provisional directors, Robert Wade, John Scott and George McJannet.

The London Motor Sales Co., Ltd.; capital $40,000; provisional directors, Chas. Abbott, Herbert John Sutherland and Albert M. Heaman, London, Ont.

Electrical Maintenance & Repair Co., Ltd., Toronto, capital $40,000; provisional directors, Ewart R. Lynch, Esten K. Williams and Mary H. Robertson.

The Pneumatic Metal Tire Co., Buffalo, N. Y.; $50,000; to manufacture a metal auto tire; by Albert E. Nelson, Edward L. Kunz and George C. Graves.

The Jarvis Sanitary Filter Co., Ltd., Toronto; capital $40,000; provisional directors, Dorothy McPherson, Harry S. Murton, Thos. D. Archibald and others.

The Metropolis Foundry Co., Metropolis, Ill.; $3,500; general machinery and foundry work; by F. W. Burman, Edgar Jones and Charles C. Leonard.

America Heating & Supply Co., Rockford, Ill.; $40,000; manufacturing and installing heating plants; by Fred H. Houston, Merritt H. Mott and Charles Franz.

The Climax Good Roads Machinery Co., Ltd., Hamilton, Ont., capital $40,000; provisional directors, John Robinson, Hanlan Robinson, Wm. J. Robinson and others.

Adam Hall, Ltd., Peterborough, Ont., capital $100,000, to manufacture stoves and furnaces; provisional directors, Wm. T. Hall, Adam L. F. Hall, and Robert R. Hall.

The Pedlar People, Ltd., Ottawa, capital $500,000; to manufacture sheet metal, etc.; provisional directors, Michael H. Ludwig, Adam W. Ballantyne, Chas. F. Ritchie and others.

The Hartford Wire Works Co., Hartford, Conn.; $14,000; by Frederick H. Crosswaite, president; Henry F. Hall, treasurer and secretary; and Alfred E. Morgan, assistant secretary.

The Pratt & Letchworth Co., Ltd., Brantford, Ont.; capital $350,000; to manufacture steel and iron products; provisional directors Ogden P. Letchworth, Robert L. Fryer, Clifton W. Sherman and others.

The Steel Rail Co. of America, New York City; metal balls and bearings; $100,000; by R. Amades Martin; Emil M. Lowy, both of 350 Broadway; Angelo E. Dadula, 1094 Woodycrest avenue, all of New York City.

The Independent Tire Co., Toronto, Ltd., capital $40,000, to manufacture automobile tires, chains and accessories. Provisional directors, Charles H. Stringer, Owen J. B. Yearsley, Charles W. Watson and others.

The Model Metals Stamping Co., New York City; stamping and working with metals; $50,000; by Charles Backer, 225 Park avenue, Hoboken, N. J.; Rudolph Rosenfeld, Martin Rosenfeld, 1829 Holland avenue, The Bronx.

The Newcomb Carburetor Co., Harrison, N. Y.; carburetors, gas engine supplies, etc.; $100,000; by Edward C. Newcomb, North Scituate, Mass.; Edwin C. Chamberlin, 4 West Eighty-fourth street, New York City; and George F. Chamberlin, Harrison, N. Y.

The John A. Crowley Co., Manhattan, New York City; machinery and tools; $5,000; by George O. Sayer, 16 West Ninety-fourth street, New York City; Ed. F. Studley, 621 Nostrand avenue, Brooklyn, N. Y.; Arthur L. Marvin, 10 Roosevelt place, Montclair, N. J.

New Construction:—

The Jones & Hopkins Mfg. Co., Nashville, Tenn., has had plans drawn for building a foundry addition and warehouse, 62 x 175 feet, iron clad frame, estimated to cost $10,000.

The American Steel & Wire Co. is planning the erection of a large warehouse in Memphis on the river front.

William J. Oliver Mfg. Co., Knoxville, Tenn., is planning improvements at its plow works, including the installation of a malleable iron plant.

The Brown Co., Mott, N. D., is having plans prepared for a machine shop and a repair shop, to be erected and placed in operation in a few weeks.

The Southside Boiler Works, Bristol, Tenn., of which Henry Erhert is president, will install additional machinery, doubling the capacity of the works.

The Dominion Iron Works, Bristol, Va., has announced that it will increase its capital stock from $20,000 to $75,000, and will erect new buildings, thus increasing the output of stoves and other foundry products.

The Queen Bee Stove Co., Tulsa, Okla., has awarded the contract for the erection of two brick buildings covering a site 60 x 120 feet, estimated to cost about $15,000. The company will manufacture gas ranges and heaters.

The Aransas Foundry, Machine & Boiler Works, Aransas Pass, Tex., is planning to erect a foundry and machine shop, 40 x 75 feet each, a boiler shop 40 x 60 feet, pattern shop, blacksmith shop, office, etc. The machinery has been purchased.

A contract has been awarded by the American Bridge Co. to the Cuthbert Bros. Co., Pittsburg, for a brick and steel addition to the office building at the old Shiffler works, Forty-eighth street and Allegheny Valley railroad, Pittsburg.

Payne Bros., Newark, N. J., have purchased a site in Trenton, N. J., at 338 Perry street, where they will establish a plant for handling structural steel. A crane will be installed at once for unloading material, and plans will be drawn for various buildings.

The J. M. Jones Sons Car Co., Watervliet, N. Y., which recently incorporated an established concern, is planning an addition which will probably be built to the west of the main structure. It has contracts ahead sufficient

to keep the plant operating for several months.

Bids were recently opened by the Sanford-Day Iron Works, Knoxville, Tenn., for the construction of a new foundry. The new building is to be ready for occupancy by May 1. The present foundry will be used exclusively for the manufacture of mining cars, while the other branches of the work will be transferred to the new shop, including the manufacture of stoves, steel ranges, etc.

The plant of the Steel Castings Co., Cincinnati, which was recently sold to Chicago interests, will be enlarged and equipped for the manufacture of Gebhard steel castings. The new owner, it is announced, is the Armor Steel & Foundry Co., Chicago, owner of the Gebhard process patents. The company owns a plant at Matthews, Ind., which, it is said, will be torn down and removed to Cincinnati, making the total plant 134 x 500 feet.

General Industrial:—

Billmire Bridge & Iron Works Co., Rochelle, Ill., has certified to a dissolution of business.

The Morton-Heer Co., Portsmouth, O., whose incorporation was recently noted, advises that it is strictly a selling organization.

The Omaha Structural Steel Co., Omaha, Neb., at its recent annual meeting, elected these officers: President, J. W. Towle; vice president, R. A. Lansaler; treasurer, C. A. Pratt; secretary, K. A. Vogel.

The Madison Brass Works, Madison, Wis., Schwenn & Vogts proprietors, whose plant was recently damaged by fire, advises that a temporary building is being erected, but that up to this time it has not figured on a permanent building.

The Pittsburg Bridge & Iron Co., Pittsburg, Pa., has placed an order with the Standard Engineering Co., Pittsburg, for a Thomas spacing table, designed for punching plates, beams, angles and channels. It will handle plates up to 40 inches in width.

The stockholders of the Detroit Valve & Fittings Co., with a plant at Wyandotte, Mich., recently re-elected the following officers: President, E. B. Whitcomb; vice president and general manager, O. T. Benjamin; treasurer, L. O. Krupler; secretary, J. F. Harrington.

The Mississippi Automatic Machine Co., Meridian, Miss., advises that it was not organized for the purpose of constructing or operating a plant, but simply for the purpose of operating shoe shining machines manufactured by the Westmoreland Machine Co., of Irwin, Pa.

The directors of the Zenith Foundry Co., Phelps, N. Y., were re-elected at the recent annual meeting; President and general manager, Hugh R. Chambers; vice president, D. D. Hubbs; secretary and treasurer, Edward Cooper. They also constitute the board of directors.

The Ohio Sterling Co., Dayton, O., manufacturing and selling foundry supplies, electrical motors, etc., has been involved in bankruptcy proceedings brought in the federal court at Cincinnati. Fred J. Bucher has been appointed receiver, with his bond fixed at $50,000.

Stockholders of the Stoever Foundry & Mfg. Co., of Myerstown, Pa., recently re-elected retiring directors and officers. The project of removing the plant to Easton, Pa., received consideration, and it is planned to have the equipment ready to move within the next six months.

The Nye Co., Buffalo, whose incorporation was noted recently, advises that it has been carrying on a sales agency business for over two years for the sale of the Jones safety device. The incorporation of the company has not made any change in the character of the business as heretofore conducted.

At the annual meeting of the William Tod Co., Youngstown, O., the following officers and directors were re-elected: President, John Stambaugh; vice president and general manager, I. H. Reynolds; secretary and treasurer, H. J. Stambaugh; superintendent, L. A. Woodard; directors, John Stambaugh, I. H. Reynolds, Paul Jones, David Tod and H. H. Stambaugh.

The Paxton & Vierling Iron Works, Omaha, Neb., at its recent annual meeting, postponed the election of a president to fill the vacancy occasioned by the death of W. C. Paxton Jr. The vacancy will be filled later. The officers and directors re-elected were: Vice president, C. G. Vierling; secretary and treasurer, Louis Vierling; manager, A. J. Vierling.

Youngstown Steel Co.'s stockholders at their recent annual meeting at Youngstown, O., re-elected these directors: Edward L. Ford, Paul Jones, John Stambaugh, Henry H. Stambaugh and David Tod. The board organized by re-electing these officers: President and general manager, E. L. Ford; vice president, Paul Jones; secretary and treasurer, John Stambaugh.

The Rome Wire Co., Rome, N. Y., recently elected the following directors: James T. Dyett, H. T. Dyett, T. Harvey Ferris, A. F. Carpenter, S. H. P. Pell, F. M. Potter Jr., T. H. Stryker, H. A. Hammond and William K. Pierce. The board organized by electing the following officers: President, J. T. Dyett; vice president, F. M. Potter Jr.; secretary and treasurer, H. T. Dyett.

The Michigan Copper & Brass Co., Detroit, at its recent annual meeting declared a semi-annual dividend of 3 per cent on preferred stock, payable at once. The stockholders elected the following directors: James E. Danaher, Jeremiah Dwyer, George H. Barbour, F. M. Alger, D. M. Ireland, William Livingstone, F. T. Moran, E. J. Corbett, E. A. Gorby, and George H. Barbour Jr.

The Detroit Copper & Brass Rolling Mills Co., Detroit, Mich., recently re-elected these officers: President, Lewis H. Jones; vice president, Richard P. Joy; assistant to president, John R. Searles; secretary and treasurer, William F. Montgomery; assistant secretary, Frank H. Hoffman; auditor, Andrew J. Peoples. These directors were elected: E. T. Swift, F. J. Hecker, Lewis H. Jones, Richard P. Joy, H. D. Sheldon, A. H. Buhl, and W. F. Montgomery.

Trade Notes:—

The United Steel Co., of Canton, O., has moved its Chicago office from 33 Dearborn street to 1132 Commercial National Bank building. A Schaeffer is sales agent in charge of the Chicago office.

The McClintic-Marshall Construction Co. has opened a Philadelphia office with quarters in the Morris building, on Chestnut street, near Broad. The new office is under the jurisdiction of W. M. Sterritt, manager of the Pottstown, Pa., plant of the company.

Lowenthal & Co., Buffalo, have opened a branch in the Ford building, Detroit, in addition to their branches in Buffalo, Cleveland and Cincinnati. Their "Elco" high speed steel can also be obtained now in Philadelphia, through Barrett & Co., Witherspoon building, and in Boston, through H. W. Hayes & Co., with whom selling arrangements have been made.

Fires:—

The warehouse of the Huntsville Foundry & Machine Works, Huntsville, Ala., was badly damaged by fire, Feb. 10, the loss being estimated at $2,000. The offices were flooded with water but the plant itself escaped damage.

Mechanical Engineers and Accident Prevention*

The Machine Builder and Safeguards—Protecting Transmission Machinery, Saws, Woodworking Cutters, Punches, Presses, etc.

By John Calder

The machine tool-builders, many of them members of this society, have already accomplished a great deal of most useful safeguarding, particularly in protecting the workman from the dangers of toothed gears in metal-working and other tools. Now and again, however, a so-called guard is encountered which is simply no guard at all, but rather a snare, and which shows conclusively that its designer had appearance rather than utility in mind.

Fig. 2 illustrates this, the pinions *PP* being securely covered on the top, which is the outrunning and safe side, by semi-circular flanged hoods, whereas the intaking and dangerous parts of the gears *WW* are unprotected and have gripped the clothes and limbs of unsuspecting operatives. The covering of the outrunning sides of gears is often desirable to prevent the lodging of chips and waste in them, but they are usually harmless when exposed. Fig. 3 shows the proper gear protection for the machine illustrated.

Numerous instances might be cited of the vague notion expressed in some current machine designs that anything which looks like a cover for a part of a machine necessarily constitutes in daily service an efficient safeguard; sometimes no regard is paid to the actual direction of rotation or to reversal of motion or to the necessity in using the tool for frequently removing a clumsy cover which is as likely as not to be left off permanently. The real points of danger in daily operation need to be studied before a satisfactory protection can be provided.

A well-designed and neatly applied guard on a machine is seldom a prominent feature and line sketches on which the safeguarding is emphasized have been prepared by the author for this paper in order to secure the definition of the subject which is usually absent from half-tones made from photographs taken in the shops. Shafts and spindles, low pulleys, and belts, intaking sides of gears, narrow clearances between fixed and moving parts, couplings, projecting screws, nuts and pins and numerous similar risks on moving parts of machines as designed are best handled for protection by the machine builder. In any case the safeguarding of these, when within the reach of the operator, is usually obligatory upon the employer and always desirable. If absent from machines when delivered, the provision of such safeguards naturally falls within the field of the mechanical engineer of the plant.

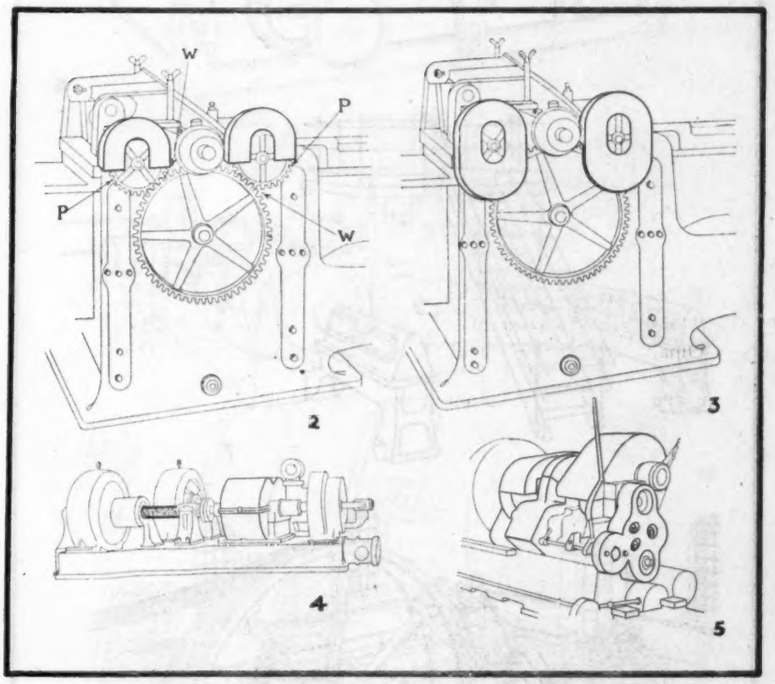


Fig. 2—Defective Gear Guard
Fig. 3—Safe Gear Guard
Fig. 4—Guarded Steam Turbine
Fig. 5—Lathe Builder's Guard

Within the scope of this paper the illustrations are necessarily limited to examples of safeguarding from only a few out of the many manufacturing industries concerned, but the principles outlined and the methods shown are applicable with occasional modifications wherever power-driven machinery is operated. Some examples are now given of the effective protection of the machine details just mentioned, a protection which can be and often is provided in greater or lesser degree by the makers of tools and of a large variety of apparatus used in the arts.

Fig 5 is typical of what the tool builders are now doing in the way of neat and effective guards for the toothed gears of lathes and other apparatus, in which access for inspection is easy, and there is no temptation for the workman to throw the guard aside as cumbersome. An illustration of the safeguarding of complicated textile machinery by the makers is shown in Fig. 6.

In this machine panels and neat sectional guards of metal are used to minimize the risk of injury at all dangerous parts while in motion. At the same time access for cleaning and inspection at rest can be had in one movement at any protected part. To secure the results indicated careful planning and study of the working conditions are necessary, but where

*Continued from page 312, issue of Feb. 9. This paper is from the *Journal* of the American Society of Mechanical Engineers.

these are given by the mechanical engineer a solution meeting the conflicting conditions of use and safety is nearly always possible.

Under the head of guarding of equipment built into position are embraced all power generators and a very large class of machines and industrial apparatus whose accident risks at dangerous parts depend upon the environment, the manner of installation and the precise nature of the workmen's duty around them. Enclosed prime movers, such as the steam turbine, Fig. 4, and enclosed high-speed engines, and the extension of electric driving with purchased power, are reducing somewhat the number of small prime mover risks, but there are still in this country numerous reciprocating engines operated by steam, gas and oil and, of considerable age in some cases, which take annual toll of lives and limbs and are inadequately safeguarded.

Protection against accident at such apparatus is not secured as is sometimes supposed, by guarding merely the dangerous moving parts. All stationary portions of such prime mover structures as may cause injury to attendants and others should be equally included in the scheme of protection. In power houses the edges of all stairs, platforms, ladders and gratings should have low fenders of metal on both sides which will prevent nuts, bolts, tools and other small parts rolling off into the machinery or striking employes in their fall.

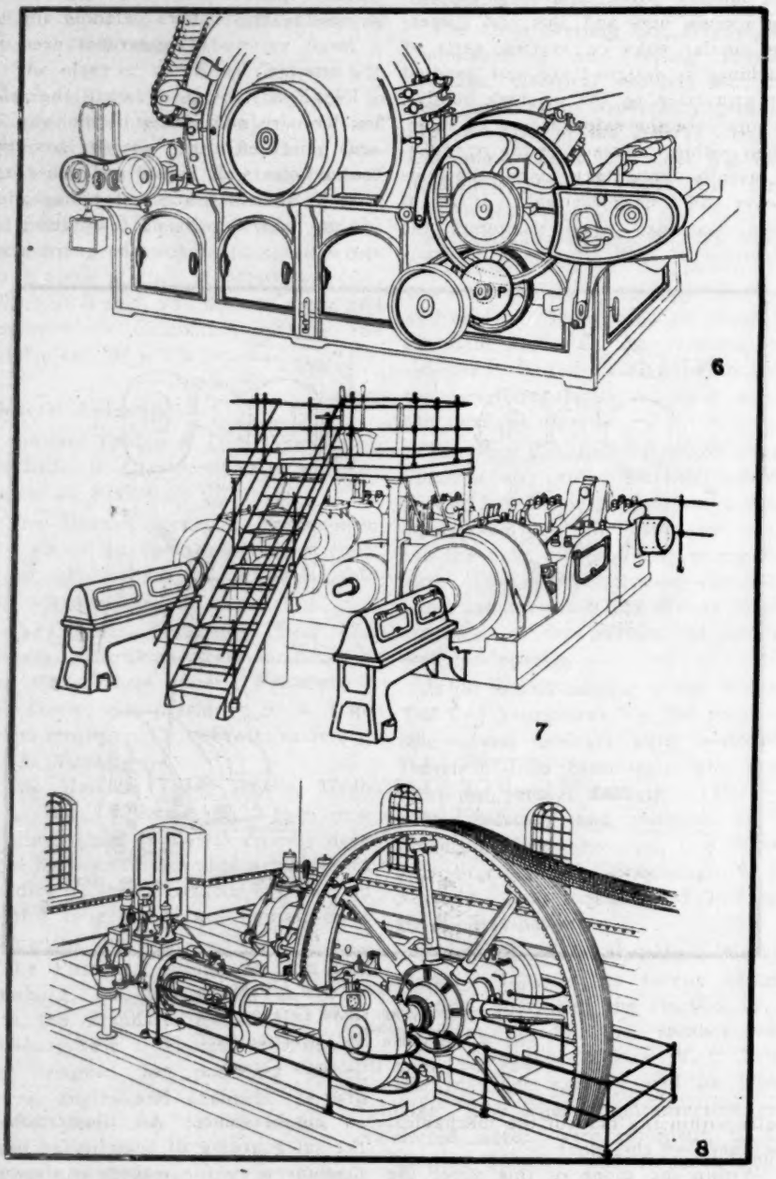


Fig. 6—Guarded Cotton Carder
Fig. 7—Guarded Rolling Mill Engine
Fig. 8—Guarded Textile Rope-Drive Engine

In addition, a double metal railing not less than 3 feet high and not nearer any moving part than 12 inches should be provided at all dangeraus places such as crank and flywheel pits, etc., and at the inside and outside edges of all stairs and elevated platforms. The fulfillment of these requirements is shown in Fig. 7 on the starting platform, tail-rods and cross-heads of a rolling mill engine, while the safeguarding of a textile rope-drive engine is shown in Fig. 8.

Engine attendants have necessarily to operate often where the footing is slippery and insecure and should be safeguarded when reaching out to bearings close to crank pits and other parts, or in passing around tail-rods and under low fly-balls and other similar parts which can and do cause many serious and not a few fatal injuries, particularly on the older prime movers still in service. Fig. 9 shows a protection the author has used on governors and gas and oil engine safeguards are shown in Figs. 10 and 11.

The mechanical engineer administering a plant has rarely an opportunity to control and co-ordinate an equipment entirely modern in character and is often much exercised in safeguarding satisfactorily archaic forms of apparatus in which designers and makers are no longer interested. It is for this reason that some illustrations are shown of forms of protection which are not called for on later and safer designs and installation arrangements.

Guarding of Transmission Machinery.

The safety of the connecting links between the power house or the shop motors and the individual machine tools and apparatus naturally calls for the mechanical engineer's attention. Transmission machinery, whatever its situation in relation to the floor level, has its accident risk conditioned by the necessity for any workman, having to touch or approach it in motion in the course of his duties.

The extensive use of multiplied motor drives, properly screened or at a safe elevation, has done away with many transmission belts, shafts, pulleys, collars and couplings in dangerous proximity to operatives at work in all of our more modern plants. The managers and mechanical engineers of many industries, however, have still to reckon daily with the accident risks of the older type of buildings and transmission arrangements and

the latter when not safeguarded are sometimes the cause of horrible fatalities and ought to be closely scrutinized in every detail.

Metal tube and disc guards for shafting, bearings and pulleys requiring to be approached closely while in motion are shown in Fig. 12, while forms of protection for transmission in old plants with insufficient headroom, are shown in Figs. 13 and 14. Seven feet clear of every moving part is considered the least height from the floor level without guarding and, even then, where a horizontal belt drives across a frequented passage at this minimum elevation it is well to have the lower side screened close to the belt to avoid injuries caused by "whipping" when the belt breaks.

Figs. 15, 16 and 17 show guards for belts and shafting driving through floors or at floor levels. Desirable and undesirable forms, respectively, of the shaft couplings, collars and set screws of transmission apparatus are shown in Fig. 32, while in Fig. 18 are illustrated the safe and unsafe positions for idle belts which sometimes depend from shafts and cause numerous accidents. Fig. 18 also shows the manner in which an unshipped belt, allowed to travel on the shaft, seizes the shaft by its own friction, aided possibly at times by engendered electrification. The slack side *a* by contact with the tight side *b* is carried into the bight *c* and the shaft rolls up the two sides together usually breaking the belt, but in some cases of very light countershafting dislodging the latter and injuring the operatives beneath.

The use of the belt perch, Fig. 19, of which there are several forms, prevents the traveling of the belt when unshipped, and accident therefrom; obviates its unnecessary wear and its possible destruction when falling into the narrow gap between a pulley and a bearing. Fig. 21 shows one of several forms of belt replacement pole which does away with any close approach by the machine operator. Special care should be taken by the designers to see that all belt shifting and machine starting and stopping gears are positive in their action. Many accidents have accurred at machines through inefficient or defective fast and loose pulley and belt arrangements suddenly starting a tool which was under examination or adjustment.

The most difficult safeguarding problems for the engineer are those relating to numerous machines used in the arts, which, after the maker and installer have carefully protected all the details already described, are essentially dangerous at the operating point, if worked at all. The variety of uses to which such apparatus is put often precludes the application of a universal guard. Nevertheless, protections claiming to be of all-round use are on the market for a number of especially dangerous machines.

No such machine, however, is effectively protected by any guard which hampers a workman, reduces his speed and earnings and has not been designed for the actual working conditions. Such inadequate apparatus is naturally removed by the workman or wholly or partially put out of action at the first opportunity and the particular safeguarding problem becomes the subject of a fruitless triangular controversy between the employer, the employe and the factory inspector.

To educate the employe to use caution and foresight about dangerous machines is difficult enough and it should not be rendered more so by calling upon him to work with an impracticable safeguard. What is needed in such a case is careful inquiry, by a competent engineer experienced in the study of safeguarding problems, into the conditions under which the employe has to operate and a solution, where such is possible, which will enable him to work with efficiency and

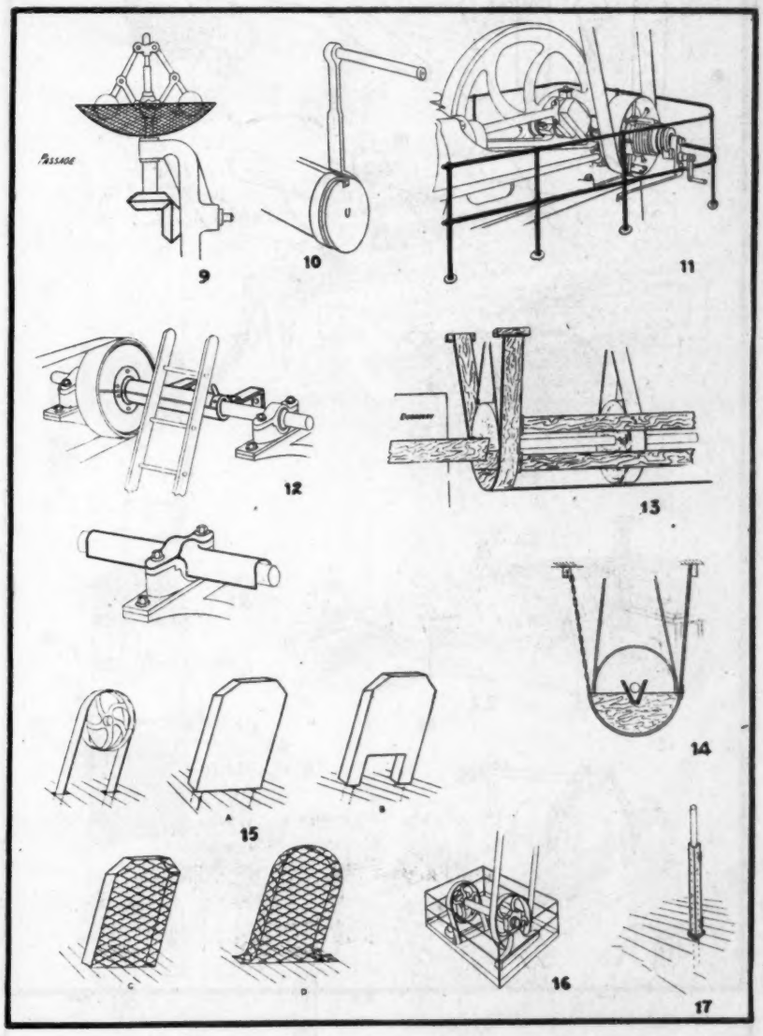


Fig. 9—Guarded Fly-Balls
Fig. 10—Gas Engine Safety Starting Crank
Fig. 11—Guarded Oil Engine and Starting Crank
Fig. 12—Transmission Tube and Disc Guards
Fig. 13—Permanent Low Overhead Guarding
Fig. 14—Detachable Low Overhead Guarding
Fig. 15—Screen Belt Guards
Fig. 16—Rail Belt Guards
Fig. 17—Box Shaft Guard

safety or at least to reduce considerably the accident risk of his occupation.

For the purpose of illustrating the problem of the especially dangerous machine, the author has confined himself to examples of accident experiences with only four out of many cases of such apparatus. These four, however, are probably the most prolific in accident to the operator when performing his usual duties. They comprise woodworking saws and cutters, punches and presses, rolling machinery of all kinds where hand feeding is necessary, and emery and other grinding wheels.

A close approach by the fingers to sharp cutting tools running at a very high rate of speed is essential in operating efficiently many woodworking saws and cutters. Consider first that king of accident producers, the common circular saw, which takes an annual toll of not a few lives. This tool, the author believes, mutilates several thousands of our workmen each year and renders many of these permanently unfit for following dextrous occupations.

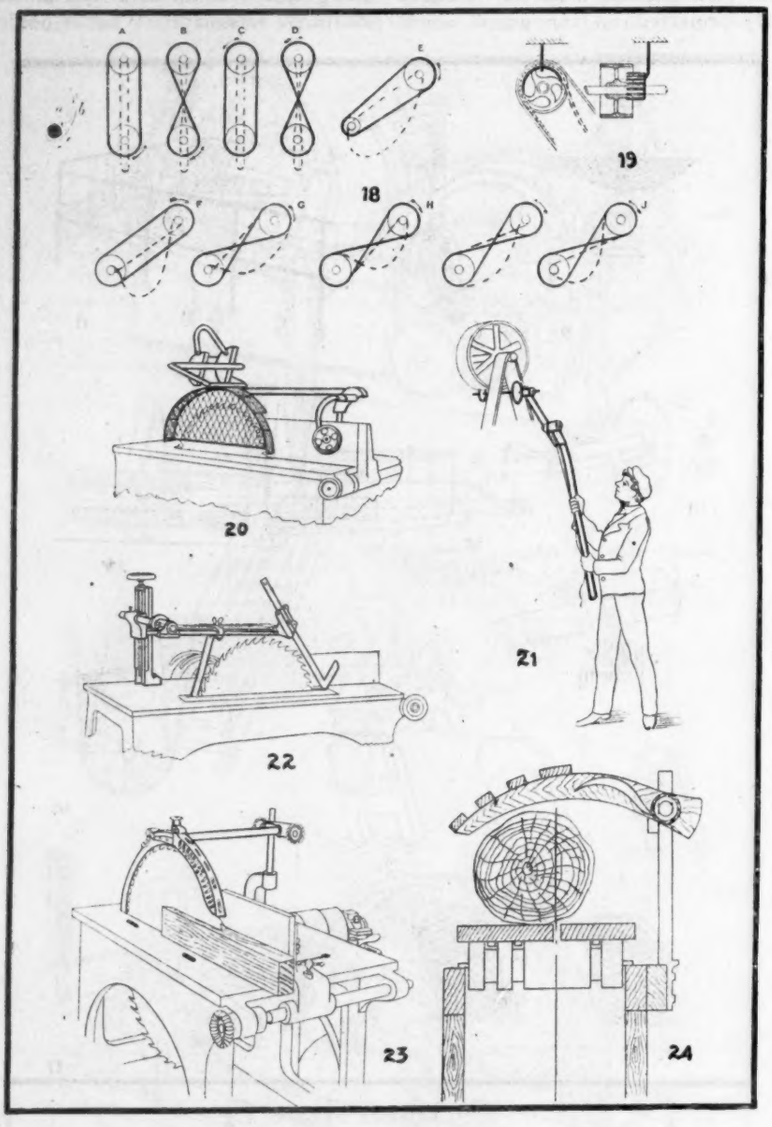


FIG. 18—SAFE AND UNSAFE IDLE BELTS
FIG. 19—BELT PERCH
FIG. 20—AUTOMATIC-POSITIONING MESH GUARD FOR VARIABLE DIAMETER CONVERTING SAW
FIG. 21—BELT SHIFTING POLE
FIG. 22—AUTOMATIC-POSITIONING BAR GUARD FOR VARIABLE DIAMETER CONVERTING SAW
FIG. 23—ADJUSTABLE SHIELD GUARD FOR VARIABLE DIAMOND CONVERTING SAW
FIG. 24—SPAR GUARD FOR LOG SAW

It is the *bête-noir* alike of employers, employes, works executives, factory inspectors and casualty insurers. What contribution can the mechanical engineer make towards conservation in this instance? In spite of claims to the contrary, such an article as a universal saw guard does not exist. On the other hand, except in the case of small diameter checking and grooving saws covered by the work, the author believes it is quite possible to safeguard all saws to varying degrees conditioned by the uses to which they are put.

An efficient as well as a safe guard is one which may have to fulfill all or any of the following conditions:

a The safeguarding must be strongly made and once adjusted must be able to retain its position and form without special care on the part of the saw operator.

b It must so protect the saw, both above and below the bench and before and behind the saw that no one can accidentally touch or fall upon the saw.

c It must not permit the work in a ripping saw to close upon the blade, mount the same or be projected to the danger of those around.

d It must not obscure the workman's vision of the line of the saw.

e It must be especially adapted to the class of work done on the saw bench and where required, it must leave all the area of the saw table clear of obstruction and also the space above the guard itself.

The ways in which these conditions for reducing saw accidents, while maintaining efficiency, have been met in the author's experience are illustrated in Fig. 20 and in Figs. 22 to 29 for various kinds of saws and applications of such, from the handling of the rough log to completely converted lumber.

Fig. 28 shows in some detail the solution of a circular saw-protection problem where the conditions were supposed by workmen and foremen alike to forbid safeguarding which would permit the machines to be worked at full efficiency. The saw bench illustrated is a combination trimmer and edger having three saws on one shaft.

The over hung saws, a rip and a cross-cut respectively, are fixed in position on the shaft ends but the middle cross-cutting saw must, with any guard, traverse the shaft freely when required for a distance of 18 inches. The work handled varies from one to three thicknesses, totaling 2 inches, and is fed into the saws on

two sliding tables of 29-inch stroke and of fixed and variable gage respectively. Thus no attachment above the bench for any guard is possible at the front or sides or for about the above distance to the rear of the saw.

No purchasable guard will meet such conditions. As finally worked out, the rip-saw has a safety parting knife fitted in its rear, and all three saws are efficiently and strongly guarded, as shown at every dangerous point. Men working at a rapid pace on task work at these benches are highly pleased with the result. They are able to use the three saws more effectively than before and without any fear of injury. The saw line is always visible through the mesh-work and pierced work, yet the operator's hands, which necessarily travel with the work, can never approach the saw teeth too closely, as they are pushed off by the projecting fingers.

The common jointer accounts for a large number of finger and hand amputations every year and Figs. 30, 31 and 33 show three forms of effective guard. In the first and third, two movements, vertical and horizontal respectively, are necessary to adapt the guard to any given piece of work. In the second, the guard supported on springs rises automatically when pushed by the work and only the transverse sliding motion is necessary for positioning. After the work has passed the guard the latter returns automatically to a position close to the cutter gap. In the other two types the guards maintain their height above the table until readjusted. All these guards can be readily swung out of the way for cutter adjustments and as easily returned for use.

(To be continued.)

Furnace to be Rebuilt

No. 3 blast furnace of the Eliza group of the Jones & Laughlin Steel Co., Pittsburg, has been blown out and will be rebuilt. The furnace was built nine years ago and in that time has made a total of 1,566,110 tons of pig iron on the original lining. The work of rebuilding this stack will be done entirely by workmen of the Jones & Laughin Steel Co., as in the case of stack No. 1 of the same group, which was torn down and rebuilt in the record time of 95 days.

The Pittsburg works of the Jones & Laughlin Steel Co. are operating at about 85 per cent of capacity, several mills having been started during the past week. Shipments of coke to the Aliquippa, Pa., plant, where the company has four new blast furnaces, will in all probability be started about March 1, although it has not been definitely decided when the Aliquippa furnaces will be blown in. The wire and tin mills at Aliquippa are running full time. It is expected that the first of the new open-hearth furnaces at Aliquippa will be started about May 1.

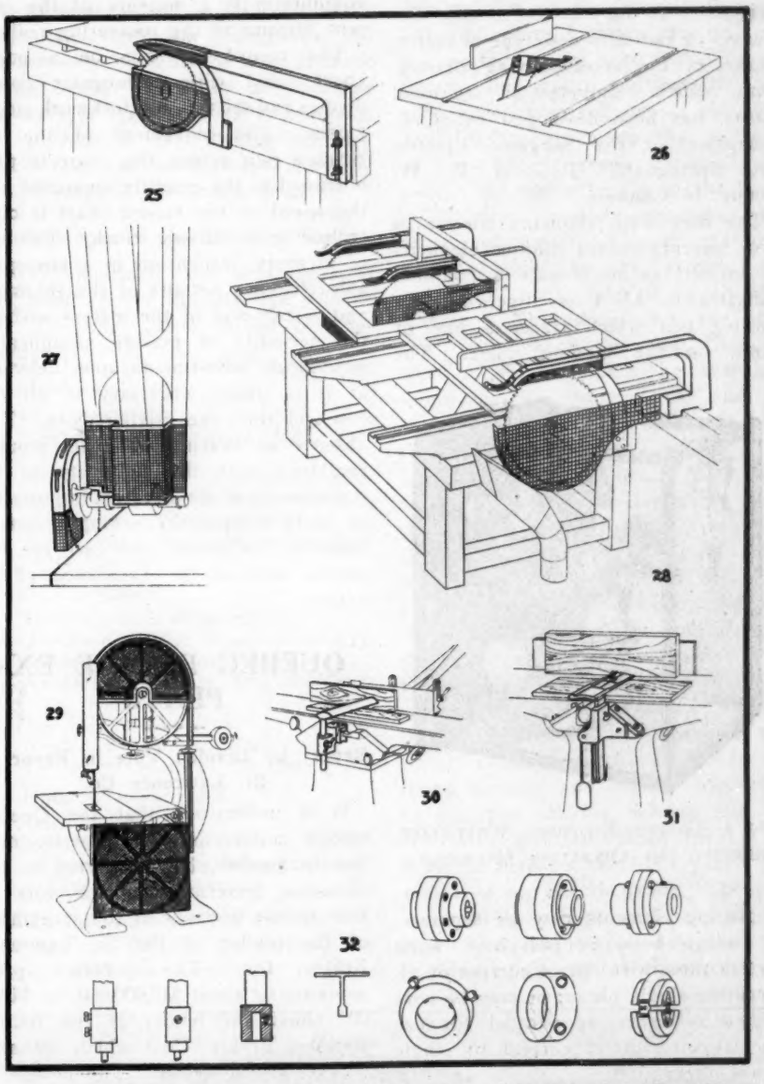


FIG. 25—MESH GUARD FOR CONSTANT DIAMETER OVERHUNG SAW REQUIRING CLEAR BENCH FOR SLIDING TABLE FEED
FIG. 26—MESH GUARD FOR CONSTANT DIAMETER SAW REQUIRING CLEAR BENCH FOR LUMBER
FIG. 27—ADJUSTABLE MESH GUARD FOR SWING SAW AND BELT
FIG. 28—GUARDED TRIPLE-SAW, SLIDE-FEED BENCH WITH CLEAR TABLES
FIG. 29—BAND SAW GUARDED AGAINST CONTACT AT ANY PART AND ALSO AGAINST SAW BREAKAGE
FIG. 30—ADJUSTABLE JOINTER GUARD
FIG. 31—TELESCOPIC JOINTER GUARD
FIG. 32—SAFE AND UNSAFE TRANSMISSION DETAILS; COUPLINGS, COLLARS AND SET SCREWS

The Lindenberg Steel Co., 1451 Broadway, New York City, advises respecting its recently noted incorporation, that it is the American representative of Stahlwerke Richard Lindenberg, A. G., Remscheid-Hasten, Germany, and is engaged in selling its products. Before the incorporation of this company, the business was carried on under the name of Joseph Schaeffer for about five months. The Lindenberg mills produce exclusively electro steel made in the Heroult-Lindenberg electro furnace, the manufacture being protected by numerous patents, and are pioneers in the making of this product.

Graphic-Recording Wattmeters

The various graphic-recording or curve-drawing wattmeters which have been developed during the past few years have, in general, been of the type employing a knife edge or wire suspension to support the moving elements. A radically new type of meter, shown in the accompanying illustrations, which eliminates all frictional errors, has been developed by R. C. Lamphier, of the Sangamo Electric Co., Springfield, Ill., and H. W. Young, of Chicago.

The measuring elements consist of two mercury-floated motor elements so located as to actuate a common indicator to which is attached a recording pen which traces a line or curve on the moving chart. The

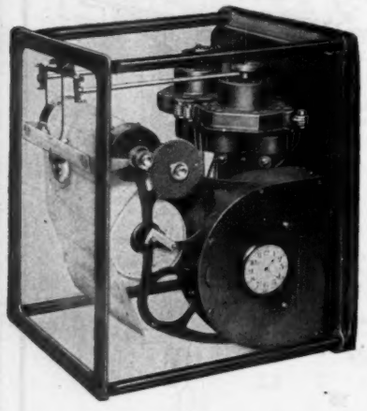


FIG. 1—GRAPHIC-RECORDING WATTMETER, SHOWING THE OPERATING MECHANISM

measuring elements may be separately energized as in polyphase wattmeters three-wire, direct current or alternating single phase; or may be connected in series or parallel for use on two-wire, direct current or single phase alternating.

The moving element is a simple metal disk or sector rigidly attached to a shaft carrying the recording pen mounting and control springs. The disk is floated in a mercury chamber which not only serves as a conducting medium for the current to be measured, but also, by the damping action of the disk passing through the mercury, renders the meter indications highly dead beat.

Surrounding the moving disk is a magnetic field in such relative position to the moving system or armature, that it cuts or passes through the armature field and tends to rotate the moving system. This rotative movement causes the recording pen to move across the chart against the restraining force of the control springs which tend to return the pen to zero position. The turning force of the mercury-floated moving element is thus balanced against the restraining or coercive force of the control springs and their point of balance or equilibrium is a measure of the current flowing in the measuring coils.

The record is made on a paper chart ruled with rectangular co-ordinates and driven by clockwork mechanism. The movement of the recording pen across the chart is proportional to the quantity measured and the speed of the record chart is controlled by a driving clock. The use of mercury suspension in a non-spillable chamber permits of the shipment and installation of the meters without the necessity of making complicated or difficult adjustments upon delivery, as it is simply necessary to fill the pen and start the driving clock. The absence of bearing or jewel trouble combined with the simplicity of installation is of the greatest importance to users in that the ordinary station operator can install and care for the meters without the assistance of an expert.

QUEBEC BRIDGE EXPERTS

Report by Divided Vote in Favor of St. Lawrence Co.

It is understood that the Quebec bridge commission of experts, now five in number, have reported to the Canadian government by a vote of four to one in favor of the acceptance of the tender of the St. Lawrence Bridge Co. The contract price amounts to about $13,000,000, or $400,000 above the tender of the British Empire Bridge Co., which adhered to the official design. The design of the successful competitor, which was considered superior, was prepared by Phelps Johnson, managing director of the Dominion Bridge Co. The St. Lawrence Bridge Co., owing to the award, will spend at least $2,000,000 in new plant.

The United States Electrical Tool Co., Cincinnati, advises respecting some recently noted new construction that the building it is erecting will cost about $22,000 when finished. The building is 86 x 200 feet, two stories, of brick, mill construction. The company expects to be installed in its building by July 1. It will have three times the present floor space.

Still Blowing Out Furnaces in East

Despite a somewhat healthier tone to the market, the tendency in the eastern district is towards a continued restriction of merchant pig iron production because makers see no inducement in present prices for remaining in blast. The large Warwick furnace at Pottstown, Pa., is now preparing to go out while, as announced, the last of the Wharton grant at Wharton, N. J., has recently gone out. The Andover furnace of the Wharton interest has been idle for several months and for the first time in a number of years all the four furnaces of this maker are now cold. The Thomas Iron Co. has blown out one of its large Hokendauqua, Pa., stacks, but has blown in an idle furnace, so that its active capacity is practically unchanged. The Oxford,

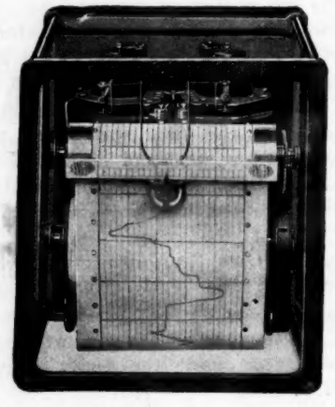


FIG. 2—GRAPHIC-RECORDING WATTMETER, SHOWING RECORD

N. J., furnace of the Empire Steel & Iron Co. has resumed after a recent accident. The Tidewater furnace of the Delaware River Steel Co., at Chester, Pa., is about to blow in to work up accumulated orders.

Contract for Tugs.—The American Ship Building Co. recently received an order to build four tugs for the Booth Fisheries Co., to be duplicates of the tugs Cincinnati, Louisville, Chattanooga and Nashville, which were built last year. The tugs will be about 70 feet long and will be built at the Lorain yard.

The Taylor-Wilson Mfg. Co., Pittsburg, has recently received an order from J. P. Piedboeuf & Cie, Dusseldorf-Eller, Germany, for pipe threading and coupling screwing machines. The coupling screwing machine is a new machine brought out by the Taylor-Wilson Mfg. Co. in the last two years.

Electric Motor Trucks for Heavy Hauling

Economy and Reliability of the Storage Battery Electric Truck—Use of Electric and Gas-Electric Vehicles in Shops, Freight Stations, Etc.

In the last issue of THE IRON TRADE REVIEW, the gasoline motor truck was considered with reference to its use by manufacturers and dealers in iron, steel and machinery lines. The opportunity, the needs, the development and available types of gasoline cars were given in detail. Besides the gasoline truck are the gasoline-electric and the storage battery electric commercial trucks. These two types of cars will be similarly discussed in the present article.

Electric motor trucks have a distinctive field of usefulness and in this field they are, in general, beyond competition. This field is defined by the limits of speed, mileage, grades and road conditions. Electric trucks have fixed economical speeds, and a fixed mileage per charge. Within the limits of this service no other type of power vehicle can compare with them in economy. Most firms can operate both gasoline and electric vehicles profitably—gas cars for excessively long hauls and the electric for regular delivery service.

In considering the application of the electric motor truck, economy and simplicity are the items for consideration. The field for their operation is divided into external and internal transportation. In internal or inside applications the electric competes with hand trucks and not gas power machines. It is estimated that for outside work 75 per cent of the hauling is done within a daily radius of 40 miles. With few exceptions, approximately one-half of this distance is an empty haul. For this mileage the average electric truck is adequate. Its mileage is over double the distance that can be traveled daily by the average horse-drawn truck.

Advantages of the Electric Truck.

In summarizing the advantages of the electric over the gasoline vehicle, the following points should be considered:

1.—Economy.
- (a) Investment.
  - 1.—Greater simplicity—fewer repairs.
  - 2.—A lower rate of depreciation.
  - 3.—A lower rate of maintenance.
  - 4.—Lower rate of insurance.
  - 5.—Freedom from insurance limitations.
- (b) Operation.
  - 1.—Less care required.
  - 2.—No elaborate repairs necessary.
  - 3.—Instant readiness.
  - 4.—Danger of fire and explosion eliminated.
  - 5.—No tanks to leak.
  - 6.—No shifting of gears.
  - 7.—Lower wage of chauffeur.

2.—Humane advantages.
- 1.—No noise.
- 2.—No odor.
- 3.—Clean, being free from grease.
- 4.—Advertising value.

The vital parts of the electric vehicle are the chassis, the motors, the battery and the controller. In the construction of the chassis there is little difference between the gas and the electric trucks except that in the electric the motor and batteries are both underslung and out of the way. The loading space on the platform of the electric truck extends over almost the entire length of the body.

On most gasoline machines the center of weight is over the rear wheels, while in the electric the weight is evenly divided on all four wheels. This distributes the load over four wheels and four tires instead of two, reducing the wear and strain on the running gear and increasing their life 40 per cent over the gasoline machine.

Electric storage battery trucks are built from a 500-pound delivery wagon size to 2, 3, 4, 5 and 10 tons capacity. They are generally provided with either one of two motors, spur gear-driven or chain-driven to the rear wheels only. There is considerable discussion whether one or two motors can be used most efficiently. The motor used in the electric storage battery truck closely resembles the street railway motor. It is at all times directly and rigidly connected to the rear driving wheels and no protective fuse or circuit breaker is provided between the battery and the motor of an electric truck. The motor must be able to withstand all the power that can be applied to start the machine at a critical time, such as

FIG. 1—A FIVE-TON, COUPLE-GEAR, ELECTRIC TRUCK USED FOR SHUNTING FIVE EMPTY OR THREE LOADED FREIGHT CARS. THE TRUCK IS EQUIPPED WITH A STANDARD, FREIGHT CAR COUPLING

FIG. 2—A TWO-TON ELECTRIC TRUCK WITH A SPECIAL BODY ON A STANDARD CHASSIS, SHOWING THE LONG LOADING SPACE AVAILABLE ON A STANDARD WHEEL BASE

on a grade or in a rut. The motor must have great mechanical strength and a high efficiency at a low speed of rotation combined with a high torque in starting. It must combine strength and lightness and not be injured by jar or vibration, and must have a well-sustained efficiency curve under overloads that are excessive, often 200 to 300 per cent, combined with a good speed torque at all speeds of operation. The motor should be enclosed in a waterproof case, for its position underneath the truck exposes it to all kinds of weather, mud, snow, etc. Much larger quantities of iron and copper are needed in this design than for an open, stationary machine. The motor used for electric truck work is a direct current, series wound machine.

The motor of an electric vehicle is always rated with reference to voltage and amperage, for both the voltage and the amperage, as well as the horsepower, vary greatly. The battery and the motor are connected by a controller of the drum type and for two-motor machines, no resistance is used in series with the motors. The various speeds of an electric motor are obtained by changing the motors from series to parallel and vice versa, both the field circuits and the armature circuits being so changed. Four speeds are generally given to a two-motor truck. These various connections are made by changing the connections leading from the batteries to the motors through the contact points of the drum barrel controller. Band brakes are supplied on the two rear wheels and an emergency brake is fastened to the shaft of the motor or motors. An electrical brake is provided by reversing the motors or by short circuiting the truck motor through resistance.

FIG. 3—A 10,000-POUND ELECTRIC TRUCK DESIGNED FOR TRANSPORTING GUNS AND HEAVY MACHINERY

Mileage and Speed.

The speed of the electric truck varies from 8 to 15 miles per hour for the lighter delivery wagons up to 1,000 pounds capacity, and from 4 to 8 miles per hour for the 3 to 5-ton trucks. About five or six miles is the average speed. This is as fast as a loaded truck can be safely run through a crowded city street or on the average city pavement. The average mileage of an electric truck is from 15 to 20 miles in a town where there are numerous hills to climb and from 20 to 30 miles in a town that is fairly level. It is impossible to state that an electric truck has a mileage of a certain number of miles, as the drain on the battery depends on the number of stops made or the number of hills climbed and the speed at which the truck is driven. An electric battery machine has a certain amount of energy stored in the battery and the rate of consumption of this energy depends entirely upon the condition under which it operates. The horsepower necessary to move a rolling load on level streets at a given speed $= \frac{W S F}{375}$, where W = weight in tons, S = speed in miles per hour, F = fractional resistance in pounds per ton.

The most important element in the electric truck is the battery and upon its care depends the mileage and life of the electric. Outside of the battery, no skilled attendants and drivers are needed, as a driver can operate an electric truck with comparatively little experience. One expert is considered sufficient for 15 machines or less. His salary is from $75 to $125 per month. There should be a day and a night washer, two machinists, a manager and a bookkeeper. Rent, insurance and power are the three items of expense.

Records.

Complete records should be kept in the garage for the information of the manager to show the efficiency of each battery and in the garage proper a tablet blackboard should be provided for the garage man's use. Space should be left on this blackboard for each car or truck in service and at every inspection the repairs needed should be checked up on this board. Records for the battery in each car for all the cars should be made out

on a charging card. This card should show the voltage, amperage, and hours of charging for each car. If distance meters are supplied on each car the reading should be taken to check up the mileage given by each battery for each charge. All batteries must be regularly inspected to keep them in good condition. Much overcharging, often leaving the battery in a discharged state for several hours, or neglecting leaky jars, using impure water and impure acids, are some of the dont's for the man in care of a storage battery.

The Edison Battery.

With the new Edison, type *A* cell, much of the trouble previously experienced with electric storage battery machines is obviated. The Edison battery is composed of an alkaline solution and two metals, neither of which reduce in an alkaline solution. The Edison cell is practically indestructible, having a life of at least 10 years, while the regular lead battery has a life of only 1½ to 2 years. The electrolyte for the Edison battery is a 21 per cent solution of potassium hydrate and a small per cent of lithium hydrate. Nickel hydrate as an active element is used in the form of a pure hydrate of nickel with iron oxide as the negative, iron plate. The Edison battery, by its durability and its light weight, is particularly well adapted for commercial vehicle work, having about 60 per cent of the weight of the lead battery. It has steel jars instead of rubber, which are not easily broken, eliminating one of the frequent causes of breakdown in the lead battery. The efficiency of the Edison battery with reference to the ratio of output and input is about 60 per cent, while the output and input of a lead battery is from 75 to 85 per cent. Considering the total cost of operation the Edison battery ranks high. The formula of paying efficiency = total cost of machine × paying load × miles covered. The reliability factor measures the time the machine is in operation.

The applications and use of electric trucks are almost without number. Three trucks of 3 tons capacity each are in the service of the New England Gas & Coke Co., large coke manufacturers in the northeast. They are used for carrying coke in bulk from the works at Everett, Mass., to customers within an 8-mile radius. The bodies are of steel and carry, under ordinary conditions, a load of 6,700 pounds. Partitions are provided with

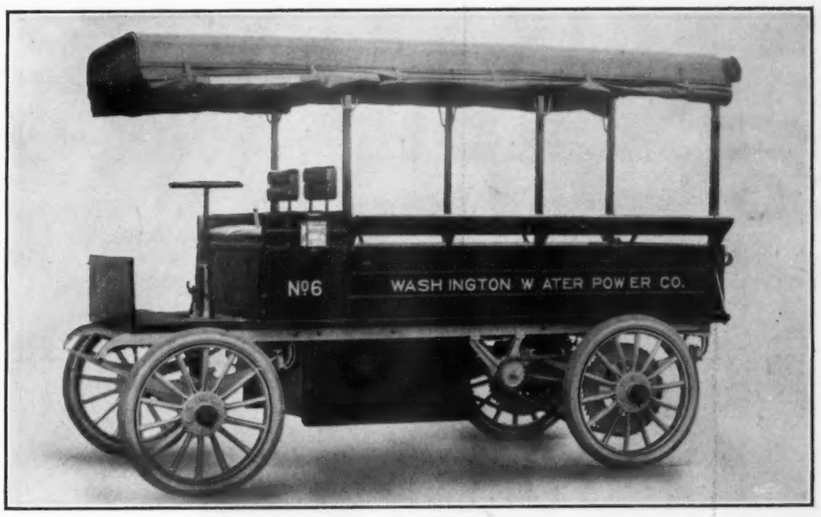


FIG. 4—A 2,000-POUND ELECTRIC TRUCK WHICH MADE A TEST RUN OF SIX MILES UP A 10 PER CENT GRADE, WITH A 2,000-POUND LOAD ON ONE CHARGE

swinging doors, so that three one-ton orders may be delivered. When this is done in regular rotation, each order may be electrically dumped, or the entire load may be emptied at once. A motor-driven winch is located under the driver's seat. The average results of the service in October, 1910, are given in Table 1.

The company states that the electric trucks produce a saving of 42 per cent over the cost of the former service by horses. The total delays amounted to barely 10 minutes per day for adjustment and repairs.

The economical handling of materials and goods in process of manufacture outside the factory building is of supreme importance. Managers and superintendents have long realized the cost of slow movement of merchandise and stock between departments under the same roof. It is only recently that the economies of mechanical transportation in the mill yards, and between the factory and the shipping point, have begun to be appreciated. Genius has placed the electric motor in competition with animal strength, and the experience

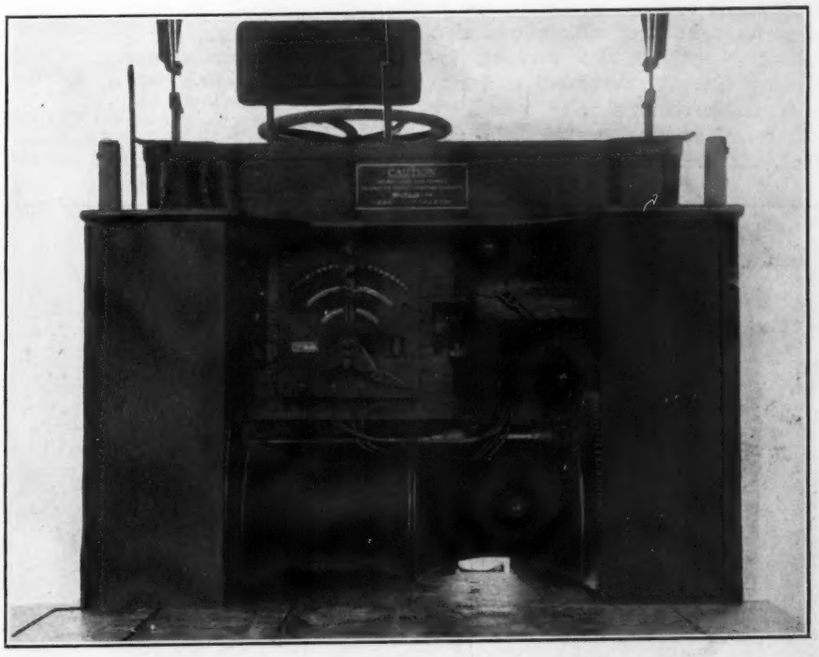


FIG. 5—A HOIST WINCH ON A FIVE-TON TRUCK OPERATED BY A TWO-HORSEPOWER MOTOR AND INDUCTION GEAR FOR LOADING MACHINE TOOLS, ENGINES OR CASTINGS. THE MOTOR IS OPERATED BY A CONTROLLER FROM BATTERY POWER

FIG. 6—A 2,000-POUND STANDARD CHASSIS, WITH A SPECIAL OVERHANGING BODY TO PERMIT BACKING UP TO LOADING PLATFORM

of progressive manufacturers all over the country shows that the horse-drawn truck and delivery wagon cannot hold their own against the power vehicle.

In a small, one-story garage, not over 50 x 25 feet, may be housed the complete equipment of five vehicles of the power-driven type, which will displace and do the work of 10 trucks and from 18 to 40 horses. One intelligent mechanic and a helper can easily care for these machines and keep them in operating order, while horse drivers, in a few days, become enthusiastic converts to electric trucks. Experience in steel mills shows that taking everything into account, including interest, depreciation, insurance, stable room, shoeing, veterinary charges, harnesses, stable help and feed, the electric truck will win out over the horse with current cost as high as 4 cents per kilowatt-hour, and by from 20 to 50 per cent in annual maintenance charges.

The following results are comparisons of the electric truck and the horse truck in a prominent eastern machine screw manufacturing plant. Previous service with horse trucks shows two 2-horse trucks running all the time with one extra in winter:

Actual cost for 2 years' operation	$9,325
Present service with one 3-ton truck, old style, 2 motors, 2½ years' cost of tires, batteries and repairs	2,280.12
Electricity at 0.7 cents per kilowatt hour, made in plant	157.50
Drivers' wages 2½ years	1,500.00
Interest on equipment	690.00
Other charges on investment	1,285.00
Total cost, electric	5,912.62
Cost per year, electric truck.	2,365.40
Former cost per year, with horses	4,662.50
Yearly saving by electric truck	$2,297.10

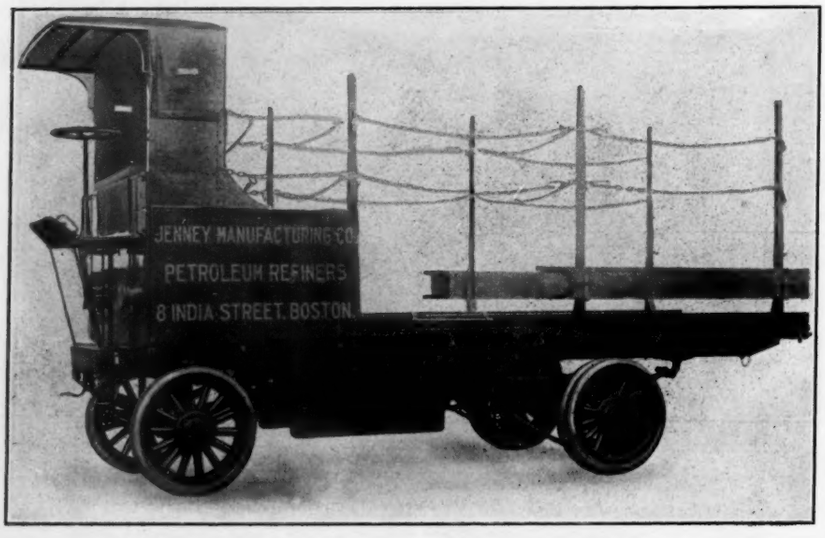


FIG. 7—FIVE-TON ELECTRIC TRUCK FOR HEAVY HAULING

A New England machinery house, building a foundry and new shops some distance from its old group, had 50 tons of materials to transfer one mile daily. By teams, this service cost 48.7 cents per ton. To extend the inter-shop industrial railroad would cost $30,000 and establish a handling cost of $1.34 per ton—a prohibitive figure. A 3½-ton electric truck was tried out for three months, handling 22 tons of mixed freight an average of one mile daily. The cost worked out 38.8 cents per ton. On castings it was 27 cents per ton.

A Fort Wayne manufacturer of steel tanks whose plant is one-half mile from the railroad solved a harrassing hauling problem by installing a heavy duty electric truck. The double handling of his sheet steel and finished product—both awkward things to deal with—kept eight wagons busy. A city franchise for a siding was obtained on condition that no locomotives be used and the task of shunting the cars was intrusted to a 3-ton couple gear electric truck. The work was done more quickly and more cheaply than by locomotives, while the extensions of the tracks into the shops allowed direct loading and unloading from cars. The money saving on horses displaced and men released amounts to $30 a day, while rush shipments were expedited.

Hand Truck Versus Electric Truck.

Fourteen longshoremen with hand trucks have been displaced at the Hoboken, N. J., docks of the Hamburg-American Steamship Co., by a three-wheeled electric platform truck of 1 ton capacity. It has a low platform 5 x 12 feet without sides and can travel 24 miles a day on one charge at a rate of 4½ miles an hour. Two similar 1-ton trucks and two three-wheeled trucks with a carrying capacity of 4 tons are used for transferring castings and finished parts from one part to another of a factory in a large industrial plant and between the factory buildings. They are taken on freight elevators to any floor in the factory buildings. The four-motor industrial trucks, which operate independently of rails and have rubber tired wheels, are today doing the work of many horses and a large gang of men formerly used.

The total cost of teaming in the

mills of the Pepperell Mfg. Co., Biddeford, Me., was over $6,800 per year when horses were used exclusively. By the addition of two electric trucks of 2 tons capacity each, a saving was made of $3,200 per year.

In a cotton plant, a 5-ton electric vehicle was installed, working 10 hours per day, in place of three horse-drawn trucks. Later an extra battery was purchased and a night crew organized, so that the truck operates 20 hours per day. As a result the entire stable of horses has been eliminated and the single electric truck with two batteries is doing the work which before required the services of seven horse-drawn trucks.

Trucks in Freight Stations.

In railroad depots and shops, the electric truck is being generally adopted. The Jersey City terminal of the Pennsylvania railroad is now using a baggage truck 12 feet long, 30 inches high, and 7 feet wide with a capacity of 4,000 pounds, having a truck weight of 2,390 pounds and a speed of from 4 to 7 miles per hour. These trucks do not have a seat for the driver; he walks in front or behind the truck as with the ordinary baggage truck. The battery is made in one tray of two cells with a capacity of 196 ampere hours. They are removable and are suspended to take away the jar. The batteries can be changed and the truck kept in operation for 24 hours a day. The wheels are 27 inches in diameter, of the artillery type, with a malleable hub, wooden spokes and a steel rim. The rim is made in two sections and is clamped to the spokes to avoid weakening the spoke when it ordinarily goes into the felloe. This type of truck has a great future in shops for transferring castings, material of all sizes and character, where men and hand trucks are now used. Four men will wheel a ton with difficulty while one man with one of these trucks can wheel 2 tons at twice the speed.

Some features of electric vehicle costs, not generally known, are pointed out by available data. The low operating cost of these machines is one of the surprising features. It is the general impression that batteries run up the cost of these machines. While it is true that battery upkeep and renewal is a large item, the labor expense of the electric is much less than on either gasoline or steam-driven machines.

Tests made on a standard, three-ton gasoline truck show a fuel consumption of 8.9 gallons of gasoline and 3.1 gallons of cylinder oil per day for an average daily mileage of 40 miles. With gasoline at 11 cents per gallon and cylinder oil at 40 cents a gallon, this amounts to 98 cents for gasoline and $1.24 for cylinder oil, a total of $2.22 a day. A three-ton electric truck has a daily mileage of about 40 miles on a daily battery charge of 28 kilowatts, costing 4 cents a kilowatt or $1.12. No appreciable quantity of oil is used with the electric. This makes a saving of $1.10 a day in power cost. A driver for a gasoline truck should be an expert mechanic, receiving $20 to $22 a week, while the electric truck driver rarely gets over $15 to $16 a week. These two costs coupled with a depreciation of 20 per cent for the gasoline truck and 15 per cent for the electric, demonstrate beyond dispute the economical operation of the electric commercial truck. The first cost of electric and gasoline trucks is almost the same.

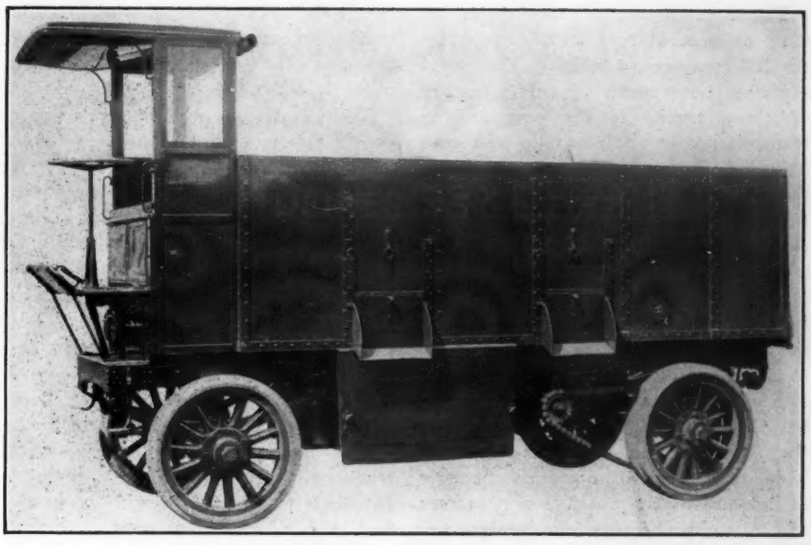


FIG. 8—A 3-TON ELECTRIC TRUCK USED FOR HAULING COKE. THE BODY IS PARTITIONED WITH SWINGING DOORS, TO PERMIT DELIVERY OF THREE 1-TON LOADS

For severe service with steep grades and mountainous roads the gas-electric has no rival, as its four-wheel steer and four-wheel drive enable it to climb grades of 25 per cent over all kinds and conditions of roads. The couple-gear gas electric truck is made in three sizes, 3, 3½ and 5 tons capacity, and has a motor in each of the wheels set parallel with the ground diagonally through the wheel. These motors are only 3 horsepower each, but are geared with circular racks on the rim of the wheel with a gear ratio of 1 to 25. The couple-gear claim is that this gives a tire efficiency of 95 to 97 per cent, which is an exceptional mechanical efficiency, as the average chain drive losses are from 6 to 15 per cent of the power transmitted.

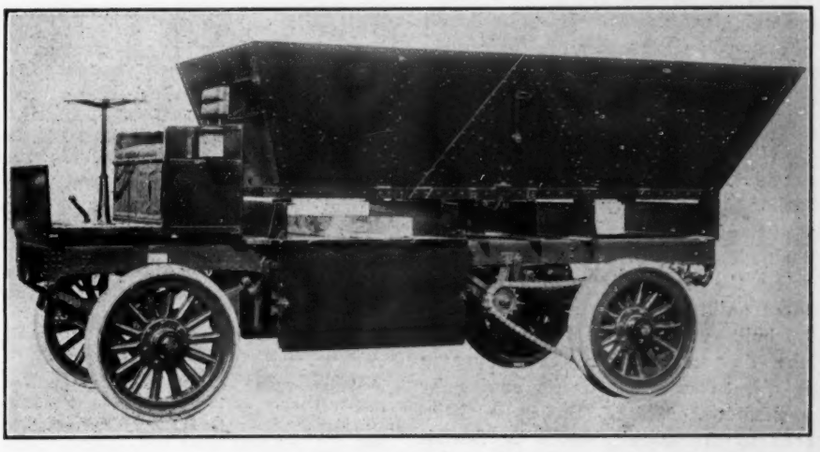


FIG. 9—A POWERFUL ELECTRIC TRUCK EQUIPPED WITH A DUMP BODY FOR HAULING SAND, CINDERS, ETC.

The motors are of special design with a momentary overload capacity of 200 per cent, making the total available horsepower 36. The feature of these trucks is the couple gear transmission in applying the power in balanced division to opposite sides of the wheels. On each end of the motor shaft is a pinion, one engaging the circular rack on the inside of the wheel and the other engaging a rack on the other half of the wheel, which forms the cover. The armature of the motor being set at a slight angle to the plane of the wheel, permits the two pinions to engage their respective halves of the double cog-rack while they remain free of the other half. This arrangement produces couple action and makes possible a reduction of 25 to 1, besides eliminating the power losses of a countershaft arrangement. The motor gear and pinions are kept clean and free from dirt as they are contained in an oil, dust and water tight wheel.

With four driving wheels the gas-electric is reliable on all roads and in all sorts of weather. Steering with all four wheels saves much time in turning around in narrow streets and in maneuvering among other vehicles. When traversing soft or snow-covered roads the four-wheel steer permits the rear wheels to travel in the paths of the front wheels. The four-motor control gives five speeds forward and five speeds reverse with a series-parallel controller.

The gas-electric truck has for a power plant a four-cylinder engine direct-connected to an interpole compound wound generator with a controller at the driver's seat. The frame of the car is built of steel channels in which the sub-frame carrying the engine is suspended from three points. The engine is especially built with no parts exposed to dirt, dust and grease. The dynamo is direct-connected to the engine by a flexible coupling. Power is delivered to the wheel motors by flexible cables, each line being fitted with a cut-out switch so that any wheel can be cut out of the circuit, if it should for any reason be disabled. The truck has a gasoline capacity of 40 gallons, which is sufficient to operate it 80 or 100 miles.

The electric storage battery couple-gear truck is equipped with the same couple-gear wheel as the gas-electric. Power is supplied to the wheel motors by a storage battery under-slung under the frame.

Coke and coal hauling is one of the special fields in which the heavier power trucks have made great savings. A number of gas-electric and electric trucks have been built with special arrangements for this work with a view of reducing tire maintenance. The power unit is a platform truck of short wheel base carrying a turntable to which is coupled the body and rear wheels of a giant coal wagon trailer. By using a trailer, three-fifths of the weight of the load carried comes on the trailer or rear wheels and the hauling capacity of the truck is increased from 25 to 75 per cent.

TABLE I.

COST OF OPERATION AND PERFORMANCE OF THREE ELECTRIC TRUCKS.

	Truck 1.	Truck 2.	Truck 3.
Pounds per day	19,011	21,432	20,110
Hours per day, working	9:30	9:58	9:41
Men, average number on truck	2.6	2	3
Cost, labor per day	$4.08	$3.68	53.67
Total miles per day	32.4	31	31.7
Miles on first battery	18.5	14	18.6
Miles on second battery	13.9	19	17.2
Running time, hours and minutes	5:57	4:54	5:04
Unloading time, hours and minutes	2:34	2:38	2:46
Trips per day	3.2	3.6	3.4

New Catalogs

BOILER MAKERS' TOOLS.—J. Faessler Mfg. Co., Moberly, Mo. Catalog No. 27, 32 6 x 9-inch pages. Describes a line of boiler makers' tools, including expanders, flue cutters, countersinking tools, rivet sets, etc.

RECORDING THERMOMETER.—Thermometers for recording temperatures between 60 degrees below zero and 800 degrees Fahr., are illustrated and described in a 40-page bulletin recently issued by the Bristol Co., Waterbury, Conn.

THE COKE INDUSTRY OF THE UNITED STATES AS RELATED TO THE FOUNDRY. By Dr. Richard Moldenke. Distributed as Bulletin No. 3, Department of the Interior, Bureau of Mines, Washington, D. C. 32 6 x 9-inch pages.

ELECTRIC APPARATUS. — The Emerson Electric Mfg. Co., St. Louis. Bulletins No. 3141, replacing No. 3137, and No. 3708, replacing No. 3704. Describe respectively single-phase induction motors and laboratory lathes for alternating and direct current.

CHUCKS.—The Skinner Chuck Co., New Britain, Conn. 1911 price list, 48 4 x 7¼-inch pages. Describes a line of Skinner independent, universal and combination lathe chucks, drill and planer chucks, face plate jaws, drill press vises, assembling stands, etc.

MILLING MACHINES.—The Garvin Machine Co., Spring and Varick streets, New York City. Circulars No. 142 and 143. Describe respectively the Garvin vertical spindle milling machine and its construction, and the Garvin No. 3 duplex milling machine with dimensions.

MINE FANS.—The Jeffrey Mfg. Co., Columbus, O. Catalog No. 26-A, 36 6 x 9-inch pages. Describes the Jeffrey centrifugal fan for mine ventilation, with numerous examples of their installation, details of construction, and tables of sizes, capacities and power required.

CENTRIFUGAL PUMPS. — Buffalo Steam Pump Co., Buffalo, N. Y. Catalog No. 230, 96 6 x 9-inch pages. Devoted to Buffalo centrifugal pumps for all purposes—engine, belt, motor and turbine driven, single and multi-stage, with tables of dimensions, capacities, horsepower, etc.

ENGINE TYPE GENERATORS.—In a 16-page bulletin, issued by the Sprague Electric Co., New York City, a partial list of installations of engine type generators, made by this concern, is included. The bulletin also contains illustrations of large installations of these generators made in various plants.

TRUCKS.—In a 38-page booklet issued by the Spicer Mfg. Co., New Philadelphia, O., a complete line of rolling mill and warehouse trucks, made by this concern, is illustrated and described. In addition to these trucks this concern manufactures adjustable wire reels, wire nail cleaning barrels, emery grinders, etc.

PYROMETERS.—The Bristol Co., Waterbury, Conn. Bulletin No. 130, 56 8 x 10½-inch pages. Describes the Bristol indicating and recording electric pyrometers, with instances of their application, reproductions of chart records, and illustrations of various types of instruments, stationary and portable.

ROCK DRILL ACCESSORIES.—A bulletin recently issued by the Ingersoll-Rand Co., New York City, illustrates and describes its complete line of drill equipment and includes tables, sizes, weights, prices, etc., of the equipment shown. Rock drill mountings, including the necessary hose and steels, are also illustrated.

CASTINGS.—In a 24-page booklet issued by the Hartford Foundry Corporation, Hartford, Conn., manufacturer of gray iron castings, its equipment and facilities for producing castings of all kinds are illustrated and described and, in addition, a large number of intricate, cored sections, which have been produced in this foundry, are shown.

FOUNDRY SUPPLIES. — Frederic B. Stevens, Detroit. 700 6 x 9-inch pages. A characteristic Stevens catalog in characteristic Stevens style, devoted to cupolas and cupola accessories, ladles, pyrometers, molders' tools and supplies, facings, core compounds, fluxes, sand sifters and mixers, core room equipment, tumbling mills, sand blast apparatus, etc.

AUTOGENOUS WELDING AND CUTTING.—The Waterhouse Co., Boston, in a 32-page catalog recently issued, illustrates and describes the autogenous welding process which is used for repairing broken castings, both iron and steel, rolled and forged steel sections, etc. A large number of illustrations of the work done by this process are included.

ASBESTOS PROTECTED METAL.—This metal and its appliance to a wide variety of service, as roofing, siding, interior sheathing and for fireproofing in buildings, is described and illustrated in a 36-page catalog, issued by the Asbestos Protected Metal Co., Canton, Mass. Asbestos protected metal consists of steel sheets coated with a compound, the basis of which is asphaltum.

Gorton Heavy Duty Cutting-Off Machine

A New Tool With Internal Cutters Designed to Take Full Advantage of Modern High Speed Steels

A new heavy-duty high-speed cutting-off machine has recently been perfected by the George Gorton Machine Co., Racine, Wis. A front view of this tool, driven by an individual 20-horsepower motor, is shown in Fig. 1 and a rear view of Fig. 2, while Fig. 3 shows the main driving gear with cutter drum, cutter blade and individual cutters assembled.

The principle involved in the design of the Gorton machine is unique. As may be seen in Fig. 3, the cutter blade is fastened around its periphery, instead of at the center, as in the case of saw machines, and the cutters are keyed to an internal bore permitting them to be set very tight without danger of springing the blade. The work is clamped rigidly in a vise fitted to the base of the machine, while the cutter drum slides on the base to permit the cutters to be fed into the work. These principles admit of driving the cutter teeth at unusually high speed and feeds and when operating at its maximum capacity, it is entirely possible to sever an ordinary 6-inch round steel bar in from 45 to 48 seconds without chatter or vibration, but it is not practicable to regularly maintain such speeds with present tool steels. The machine is made unusually powerful in order to take advantage of improvements in high-speed steels in the future, it being the intention of the builders to ultimately cut off 6-inch round steel bars in 30 seconds and the power and strain requirements of this speed have been kept in view by the designers. With the present high-speed steels, it is said the machine will sever 6-inch bars in one and one-half minutes. The type illustrated herewith will cut 1½ to 6-inch rounds and 1½ to 5½-inch squares, and may also be used for cutting 6 to 8-inch rounds, which additional diameter is accomplished through back feeding 2 inches by hand.

The base of the machine is a single casting weighing slightly over 5,000 pounds, heavily ribbed internally, the upper portion on each side being cored out to a box section. The bottom is cast solid, 1½ inches thick, forming a reservoir for the cutter lubricant. The machine proper occupies a floor space 3 feet wide and 11 feet long.

The cutter drum slide is cast in one piece, weighing 2,400 pounds, its central portion being cored out to form a large semi-circular reservoir containing the oil used to lubricate the cutter drum bearings. The cutter drum cap is bolted to the slide with four 1¾-inch steel bolts. This casting weighs 1,375 pounds, carries the motor on top and is bored at the left to take the main drive pinion bearings which are clamped in position.

The cutter drum, cutter blade and main driving gear, Fig. 3, although readily taken apart, are fitted to form practically one piece. The main gear is 60 inches pitch diameter, 3½ inches face and meshes with a driving pinion, 5 inches pitch diameter and 4-inch face, forged integral with its shaft. The pinion is belted direct to the motor, forming a compact, steady drive. The pinion shaft is 3 inches in diameter and runs in the three bearings, that on the front of the machine being 7 3-16 inches long and on the rear 7 inches long, with a steady bearing 4 inches long next to the clutch. The angle of the drive is such that comparatively little pressure is placed on the cutter drum bearings. The cutter drum is keyed to the main gear and contains ten steel studs, over which the cutter blade itself fits snugly, secured by ten ⅞-inch countersunk screws. Different cutter blades are used, depending on the work to be done. The one shown in Fig. 3 is provided with 14 ⅜-inch Taylor-Newbold high-speed cutters. This blade is ⅜-inch thick and is used for cutting various bars from 2 to 6 or 8 inches in diameter.

Secured to the rear end of the driving pinion is an expansion ring clutch, 14 inches in diameter, which is used to start and stop the machine, the motor being allowed to run constantly.

Fig. 2 shows clearly the method of driving from the motor by means of a 7-inch belt running over a 30-inch pulley fitted to the pinion shaft. The pulley makes 350 revolutions per minute, driving the cutter teeth 76 feet per minute, a speed suited to all ordinary grades of steel. For ordinary work a 20-horsepower constant speed motor is employed, operating at 800 revolutions per minute, and when the material to be cut varies greatly in hardness a 2 to 1 variable speed motor is used.

Cone pulleys with seven steps, belted to the pinion shaft, supply the feed, which may be varied from 1½ to 6

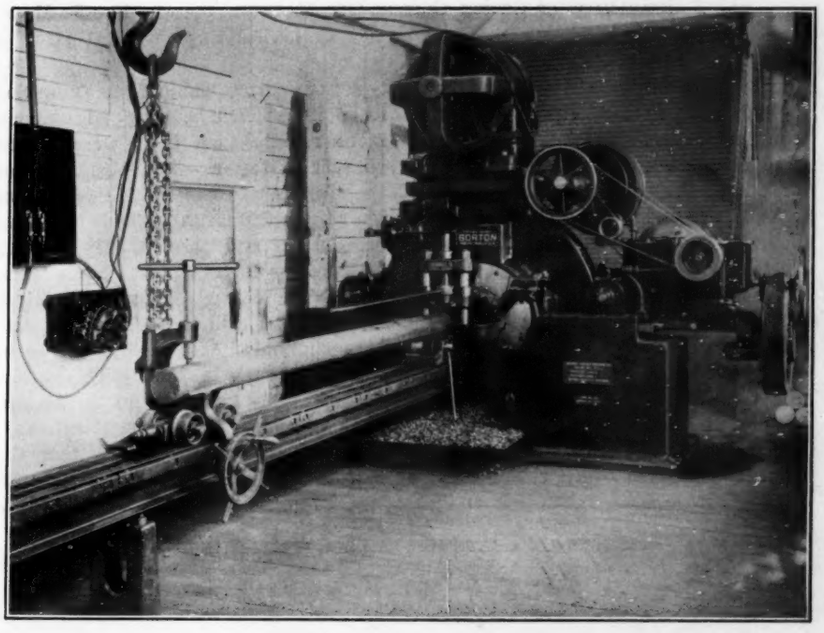


FIG. 1—GORTON CUTTING-OFF MACHINE DIRECT-CONNECTED TO A 20-HORSEPOWER MOTOR

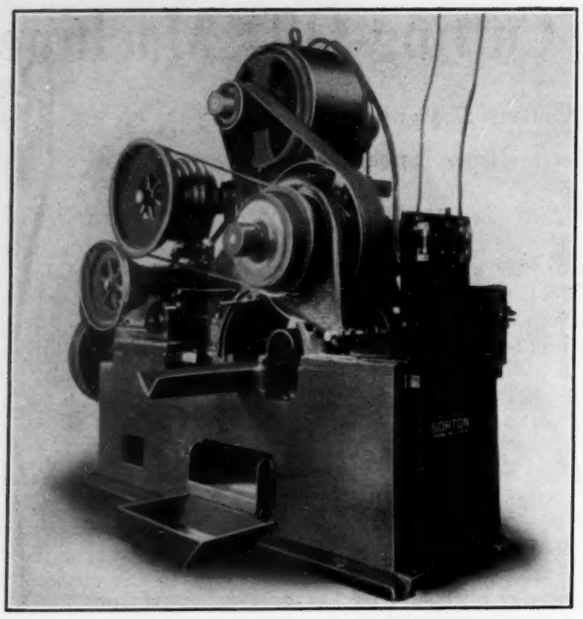


FIG. 2—REAR VIEW OF GORTON CUTTING-OFF MACHINE

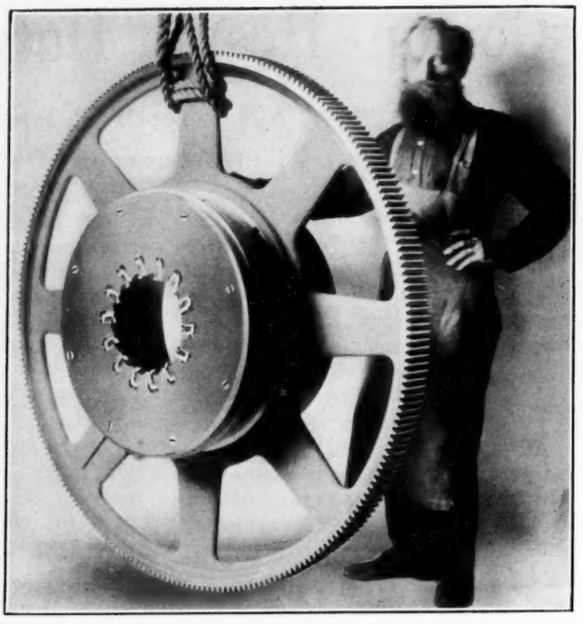


FIG. 3—MAIN DRIVING GEAR WITH CUTTER DRUM AND BLADES

inches per minute. The lower cone pulley is connected with a gear box containing forward and quick-return feed clutches, operated either by hand or automatically with positive knock-outs at the ends of the stroke, adjustment being provided for various diameters of stock.

As shown in Fig. 1, the machine is provided with a clamping vise sufficiently powerful to permit the operator to readily apply a pressure of 25,000 pounds to the work. The bar is supported by a stock-handling trolley which runs on a track 22 feet long consisting of two 7-inch channels. The trolley is operated by a hand wheel connected to a rack and pinion and is provided with a measuring arrangement. The stock is delivered through the machine, that which is cut off being forced from the trough at the rear, shown in Fig. 2, into a truck or onto the floor. Special attention has been paid to oiling devices and to the disposition of chips which fall on chip screens contained in the chip pans shown in the side openings in the base.

It is a well established fact that any type of cutter subject to vibration loses its efficient cutting edge much more rapidly than if it were driven without vibration. The steadiness of the Gorton machine, which is one of its principal features, tends to long life cutters and permits the work to be done at high speeds. Some tests of this machine were recently made at a large tube mill, cutting round steel bars containing 0.15 to 0.25 per cent carbon in each instance. The results of these tests are given in the accompanying table. Another test with Taylor-Newbold cutters showed that the cutters needed regrinding only after 30 hours' continuous work, during which time the cutting speed was 91 feet per minute. On this test the machine cut off 200 pieces from 2½-inch stock in 200 minutes, including time both for setting and cutting, or at the rate of 720 pieces cut off in 12 hours with one man and a boy.

TESTS OF GORTON CUTTING OFF MACHINE.

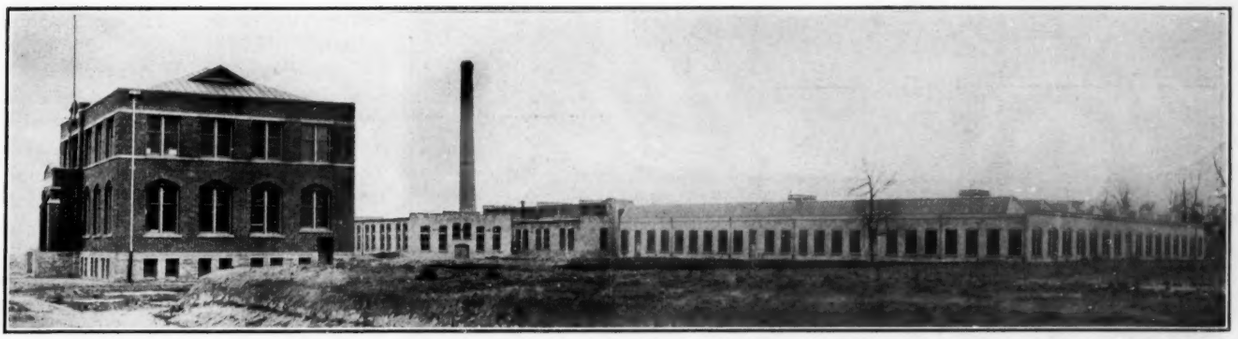
Size.	Setting time, seconds.	Cutting time, seconds.	Total time, seconds.	Number of cuts per 10 hours.
3-inch round	90	43	133	270
4-inch round	93	57	150	240
4½-inch round	94	77	171	210
5-inch round	105	84	189	190
5½-inch round	113	105	218	165
6-inch round	125	115	240	150

The net weight of the machine is 19,000 pounds and its principal dimensions are as follows: Height over-all, 8 feet 2 inches; width exclusive of stock rack, 4 feet 9 inches; length, 11 feet 3 inches. The stock rack is from 22 to 42 feet in length, depending on the length of bars to be cut.

Book Review

The Corrosion and Preservation of Iron and Steel, by Allerton S. Cushman and Henry A. Gardner; 373 6 x 9-inch pages, illustrated. Supplied by THE IRON TRADE REVIEW for $4, net.

The authors of this work need no introduction even to those whose knowledge of the literature and investigations of the subject is of the most limited character. Dr. Cushman's work in connection with the Department of Agriculture and the American Society for Testing Materials, entitles him to speak authoritatively and his utterances command respect. Mr. Gardner is director of the Scientific Section of the Paint Manufacturers' Association of the United States, and has also had abundant experience in the compounding and testing of preservative coatings. As might be expected, Dr. Cushman maintains the theory of electrolytic corrosion, as in all his writings of recent years, and is able to practically prove his case. Some of the more recent metallurgical processes employed in the production of refined iron and steel are the direct result of Dr. Cushman's investigations and suggestions, and some manufacturers have not been slow to make the utmost of these discoveries and recommendations. The book is a valuable addition to scientific and trade literature and is written in an interesting style.



A Plant for the Manufacture of Milling Machines

Description of the New Works of the Kempsmith Mfg. Co.— Arrangement of Tools and Features of the Overhead Trolley System

Specialization and the division of labor are becoming more pronounced in all branches of the iron, steel and machinery business and machine tool manufacturers are finding it particularly expedient to specialize and reap the rewards of concentrated effort. A few years ago, when the design of machine tools was a much more simple matter than it is at present, it was possible for one firm to put out an extensive line of tools and keep them all up to date. Today the difficulties of such a task are enormously multiplied and some manufacturers are now confining their efforts to one line of machines as much as possible.

An interesting example of the results of this trend toward specialization in the machine tool field is found in the works of Kempsmith Mfg. Co., Milwaukee, which are devoted to the manufacture of milling machines exclusively. This company has recently completed a new plant which, on account of its specialized nature, employs systems and equipment that are well adapted to the peculiar needs of milling machine manufacture.

The buildings of the new Kempsmith plant consist of a machine shop, power plant, pattern shop and office. The main building is of the modern structural steel, saw-toothed construction with a concrete floor and roof. This building is 300 feet long and 250 feet wide; the pattern shop is 90 x 50 feet and the power plant is 100 x 50 feet, each building having a steel frame with concrete floor and roof, fireproof construction being adopted throughout as a standard. The office is in a separate building and is modern and fully equipped.

The general layout, Fig. 6, was planned with the idea of convenience, direct-routing being adopted so that parts in process of manufacture are subject to a minimum of handling. The arrangement in the factory is such that these parts in their travel from one machine to another make a circuit of the shop from the machining to the assembling, testing and shipping departments. The factory is under a double system of supervision. One superintendent has charge of the manufacture of small parts and the other looks after the production of large castings, the assembling, testing and shipping departments. The machines are arranged in groups with all those of one type in a single group driven by one motor. The motors are suspended from the steel roof trusses on frames specially designed of I-beams fastened with U-bolts. This permits shifting the motor when necessary and at the same time ob-

Fig. 1—Assembling Floor and Benches, Showing Overhead Trolleys in the Kempsmith Mfg. Co.'s Plant

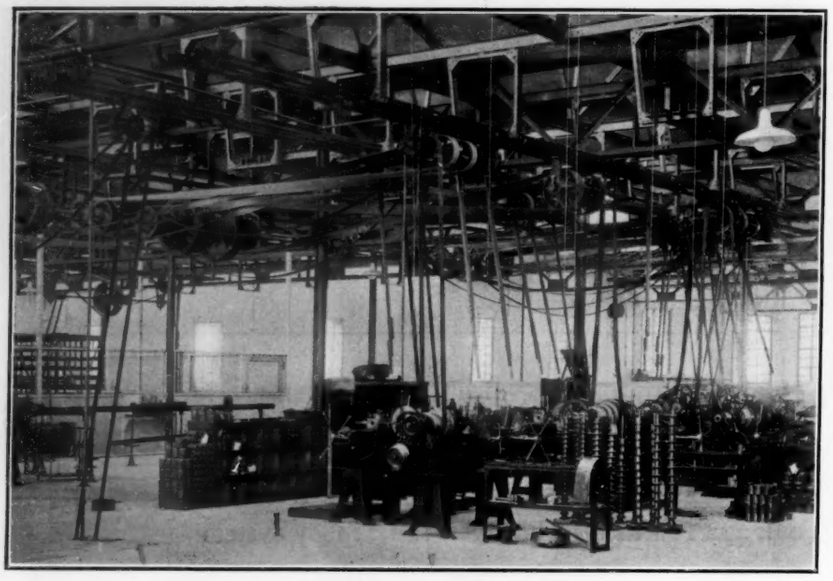


FIG. 2—TURRET LATHE DEPARTMENT, SHOWING MOTOR GROUP DRIVE

viates cutting any of the steel work in mounting the motors. The line shafting is in no case very long, and since in specialized manufacturing of this kind most machines can be in operation 75 per cent of the time, the group drive system is more economical than individual motor drive. Only where machines are in intermittent and irregular service is the individual motor employed.

A rather unique feature in connection with the line shafting is the brackets, Fig. 7, that are employed to lower the shafting about 3 feet below the main beams. To bolt the bearing bracket on the horizontal members of the roof trusses would bring the shafting so high that the belts would be too long. Steel brackets built up of channel and angle sections are used to support the roller bearings which are used throughout.

Milling machine castings are not very large and therefore a single rail trolley system with electric hoists was adopted to serve the machines and has proved as efficient in operation as a large traveling crane, which would be much more expensive both in first cost and maintenance. By referring to Fig. 6, it will be seen that the several trolley systems are so planned that parts can be moved from one part of the factory to any other in a few minutes. The electric hoists, provided with controlling devices, will elevate the largest milling machine with all its equipment fully boxed for export and move it at a rate of 5 feet per second. Overhead switches are used to transfer the trolley with its load from one beam to another. The lathes, grinding, milling and automatic machines are not used to machine large castings, so do not require a trolley system to transfer parts in process of manufacture.

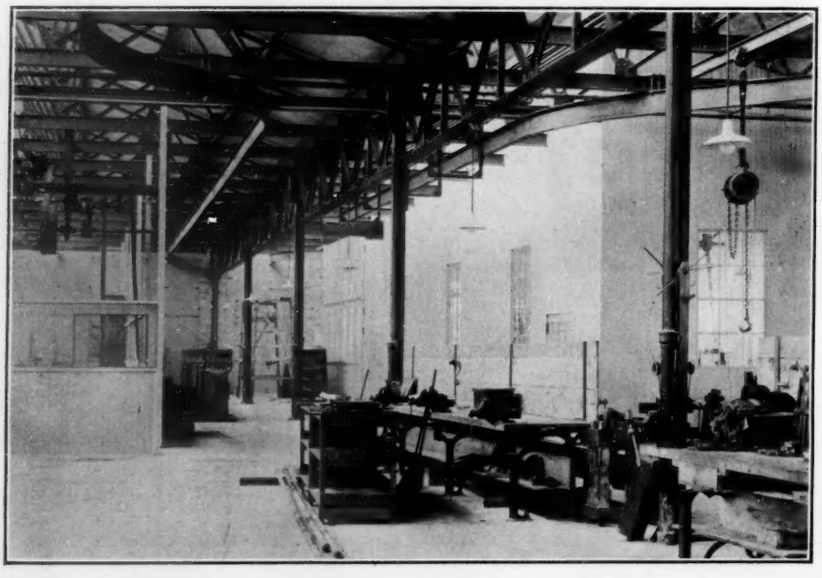


FIG. 3—VIEW OF THE INSPECTING FLOOR, SHOWING OVERHEAD TROLLEYS AND CASTING STORE ROOM AT THE RIGHT, WITH FINISHING ROOMS ON THE LEFT

That section of the main factory farthest to the east and nearest to the railroad track is used for receiving and shipping, the trolleys, as shown in Fig. 8, running directly over the tracks, giving excellent facilities for unloading and loading cars. In this part of the building, also, are situated the rough castings store room and the finishing and polishing rooms. The castings are unloaded from cars directly into one door while the complete machines are shipped through the other, passing through the finishing and polishing rooms before shipment. The finishing and polishing rooms are completely enclosed to keep dust out of the rest of the factory.

The tool room is centrally located between the manufacturing and assembling departments. There is a delivery window on each side and the equipment is so planned that there is no delay in waiting for tools. The stock room is also conveniently located and is equipped with steel bins to allow the storage of machine parts completely finished but awaiting assembling. It is here that the cost accountant, timekeeper and stockkeeper have their offices.

The assembling floor is located between the large and small manufacturing departments, a row of benches extending through the center. The trolley system makes a complete circuit of the assembling benches and is in constant service in shifting the machines that are being assembled.

The foreman's offices are completely enclosed with glass and are elevated about a foot above the shop floor, which permits the foreman to make a complete survey of his department at a glance without moving from his desk. In the southwest corner of the building provision is made for a row of Kempsmith, individual motor-driven milling machines. These machines are to be used for demonstrating and experimental purposes. The equipment of this department will include a complete set of electrical instruments and automatic recording devices.

The office is a modern two-story building finished in quartered oak. The

first floor contains the general office and private offices of the general manager, purchasing agent and sales manager. On the second floor are the drafting room and the offices of the engineering department. The basement is equipped for the convenience of the employes and has a dining room and kitchen in addition to a laboratory and school room. Apprentices have weekly classes under the supervision of an instructor from the University of Wisconsin, who gives them personal attention. This is very helpful to the young men and it keeps them alive to both their own interests and those of the company. They receive their regular pay during the time spent in school work. A modern telephone system is installed which gives connection between all departments and buildings.

The boiler equipment consists of two 100-horsepower, Milwaukee, horizontal return tubular boilers, provided with steam flue cleaners. The boiler breeching connects with a radial brick chimney, 4 feet 6 inches inside diameter at the top by 100 feet in height. The draft is governed by hand-operated dampers placed in each boiler flue. The boilers are hand-fired. Space is provided for the future installation of two boilers of the same size and type. The boiler feed pump delivers hot feed water from a 200-horsepower Cookson open heater. The feed water heater, boiler feed pump and the vacuum pump are located in a space back of the boilers, ample room being provided. Water is taken from the city mains.

The Webster exhaust steam system of heating is installed throughout the plant, the exhaust main from the engine being provided with an automatic back pressure valve, but live steam may also be used if required, this being automatically arranged for through a pressure reducing valve.

The electric generating equipment consists of one 14 x 30-inch, 200-horsepower, 120 revolutions per minute Vilter rolling mill type Corliss engine, direct-connected to one 150-kilowatt, 250-volt, compound wound, continuous current Crocker-Wheeler generator. An automatic oiling system is provided. The engine is operated noncondensing, since the exhaust steam is used for heating, as previously described.

The switchboard consists of six panels of 2-inch dull, black-finished slate, mounted on pipe framework of the latest design. It comprises one generator panel, one spare generator panel, one balancer panel, one four-circuit power feeder panel, two four-circuit lighting feeder panels and a swinging voltmeter bracket. The feeder panels have double and triple pole circuit breakers mounted on them, no switches being provided. Two pole breakers are used on the power feeder panels and three pole breakers on the lighting panels. Each feeder circuit has its individual watt-hour meter and a detailed record of the energy in each of the various departments of the factory is thereby obtained. For the protection of the balancer a three-pole circuit-breaker was provided. This is connected between the generator bus and the lighting feeder bus. One release coil only is provided, this being on the neutral bus. Should the balancer become overloaded, due to excessive unbalanced load, all three legs are opened simultaneously, entirely eliminating any chance of burning out the lamps on the lighting system from an unbalanced condition.

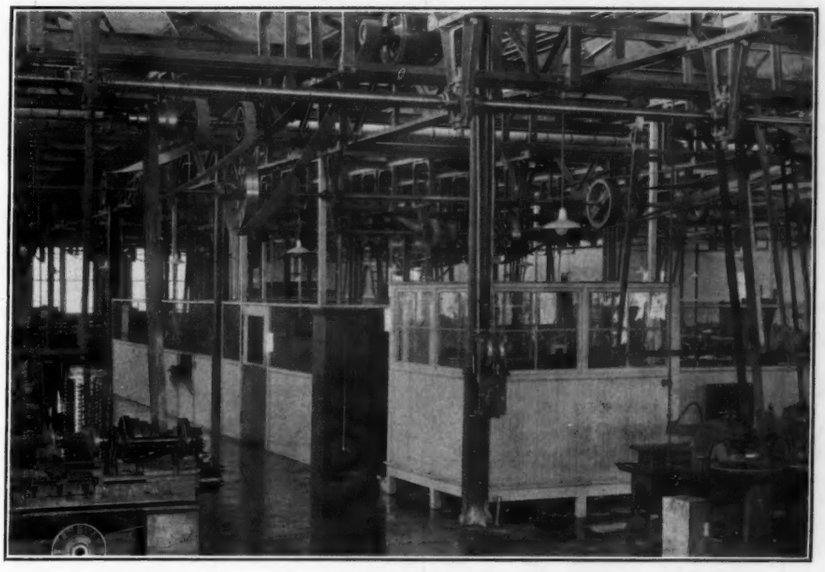


FIG. 4—ANOTHER VIEW OF THE KEMPSMITH PLANT, SHOWING THE FOREMAN'S OFFICE, WITH TOOL ROOM IN THE REAR

All wiring between the generator and switchboard and from the switchboard to the machine shop, pattern shop and office, is underground, and a conduit system, constructed of bituminized fiber conduit laid in concrete, is installed.

The wiring for the machine shop,

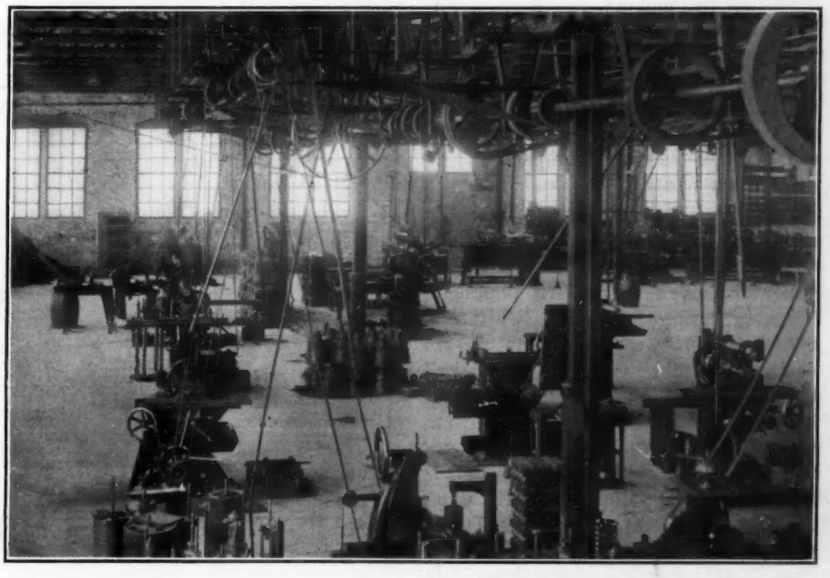


FIG. 5—A VIEW OF THE MILLING MACHINE DEPARTMENT WITH ONLY A FEW OF THE TOOLS IN PLACE. THE OVERHEAD DRIVE IS CLEARLY SHOWN

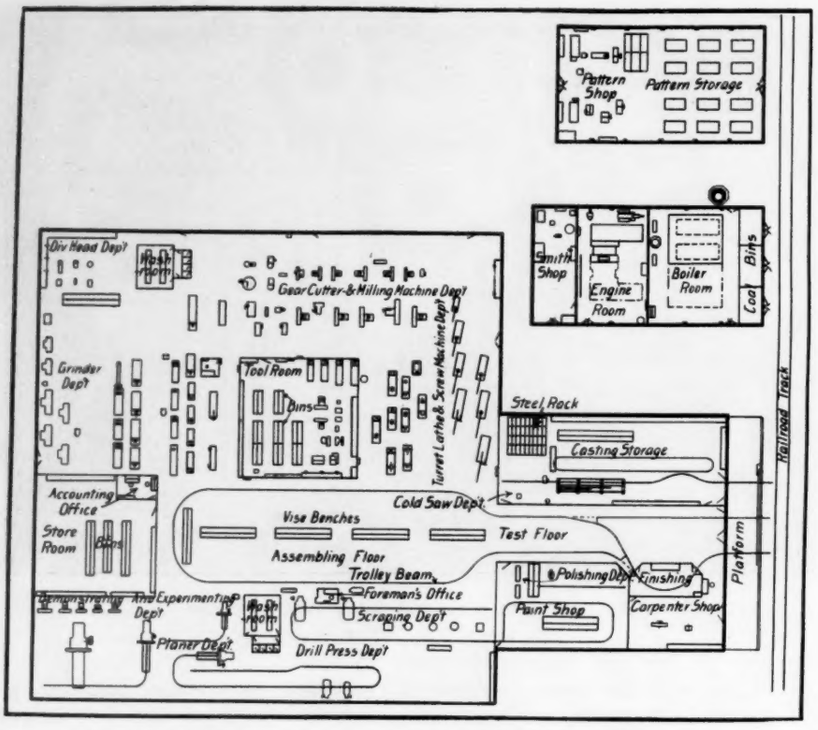


FIG. 6—GENERAL ARRANGEMENT OF THE KEMPSMITH PLANT

pattern shop, power plant and blacksmith shop, is laid in rigid iron conduits. The distribution cabinets are placed as near to the center of distribution as is practicable, and are constructed of steel with slate panels and switches and copper busses. All conduit terminals are made with conduit fittings with porcelain covers and a minimum amount of wire is exposed. Crocker-Wheeler and Allis-Chalmers motors are used and are all shunt wound with the exception of those operating the planers, which are heavily compounded. Liberal belt centers were provided, allowing good belt contact and consequent cool operation of motor bearings. The Allen-Bradley Co.'s motor starters are used throughout and are mounted for each motor on a slate panel.

The illumination of the machine shop, pattern shop and power house, was carefully planned with every consideration given to modern illuminating engineering principles. Uniformity and economy were the prime objects desired and they were accomplished by the installation of a unit consisting of a shock-absorber conduit stem and a steel porcelain enameled reflector covering a 150-watt, bowl-frosted Mazda lamp. These units are hung 25 feet apart and 10 feet above the floor, the plane of illumination being 4 feet about the floor. The illumination varies from a maximum of 4.8 foot-candles to a minimum of 2.1 foot-candles and has been found very satisfactory, individual units being needed only in a few locations. A most interesting feature of this installation is the fact that with this high intensity of illumination, only 0.21 of a watt per square foot of floor space is necessary.

The Bowles-Gifford Co., New York City, engineer, announces the removal of its offices to 25 East Twenty-sixth street, Madison Square north.

Installation of a Low Pressure Turbine

By P. Bendixen

About two years ago the Bettendorf Axle Co., Davenport, Ia., was considering an addition to its electrical equipment due to the growth of the plant, and made a thorough investigation of the various prime movers suitable for the purpose. Taking into consideration the heating of the shops in winter and the fact that the old power plant was running non-condensing, all factors pointed to the low pressure or exhaust turbine as the most suitable power unit to install, from the standpoint of reliability, simplicity, economy and maintenance.

The power equipment at that time consisted of two 100-kilowatt, direct-connected, high speed tandem compound engine-driven units, a number of hydraulic pumps, and an air compressor exhausting into one header, making an ideal arrangement for connection to an exhaust turbine. Having made a study of various turbine plants, the company decided to install a 500-kilowatt, horizontal Curtis turbine. This turbine was put in operation in September, 1909, and has since been in service for about 14 hours per day. It supplies all electrical power required by the plant, which at present amounts to 250-kilowatt average load; this power being used mostly for the operation of cranes, the lighting of shops, and for lifting magnets. When machinery now under construction is completed and installed, the load will be increased to about double. The main steam supply is derived from the exhaust of the hydraulic

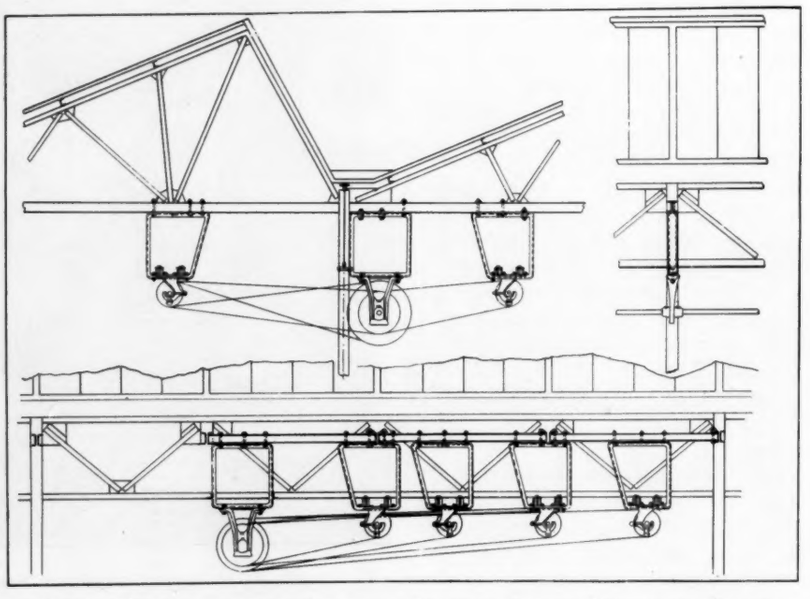


FIG. 7—METHOD OF SUSPENDING LINE SHAFTING AT THE KEMPSMITH PLANT

pumps, but owing to the fact that these pumps are subject to interrupted service due to breakdowns on the system, other means of supplying steam had to be provided and a connection was, therefore, made from the exhaust header to the high pressure steam pipe through a 4 x 8-inch Foster pressure-reducing valve. By means of this connection the required amount of steam to keep the turbine in operation is secured. This arrangement works very satisfactorily, as the valve operates within a range of one-half pound drop in pressure. The average back pressure is about three pounds and to take care of an excessive back pressure, the exhaust header is provided with a 12-inch relief valve set to operate at five pounds pressure. All steam to the turbine passes through an 18-inch, two-stage separator, which separates all oil and moisture from the steam. A 3,150-foot Worthington condenser is installed, the condensed steam being returned to the boiler feed water heater.

Performance of the Turbine.

While no figures are available to substantiate a statement as to the exact performance of the turbine, it is thought possible, when running with 28-inch vacuum, to recover 75 per cent of the energy delivered to the pumps, compressors, and reciprocating engines. In cool weather it has been possible to run for weeks with a vacuum of from 29 to 29½ inches, this, of course, making quite a difference in the steam consumption. In order to maintain a good vacuum, it has been found necessary to pipe the steam seal in which the carbon packing rings are located with high pressure steam to insure against any leakage of air around the shaft. The amount of steam required for this purpose can best be found by experiment, and when once adjusted requires very little attention.

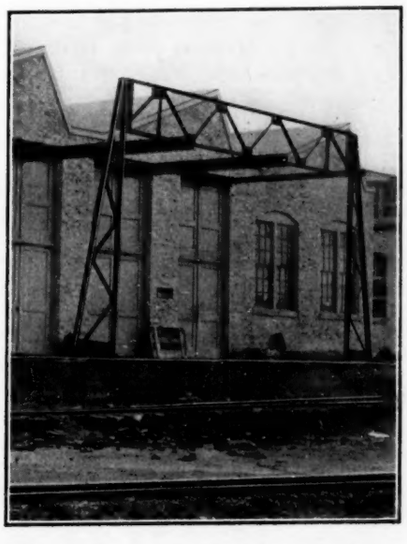
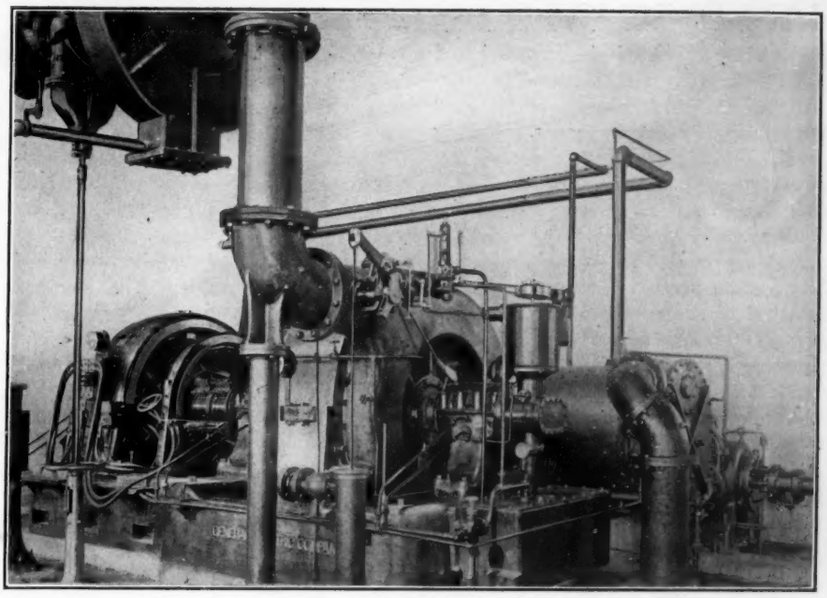


FIG. 8—SHIPPING AND RECEIVING PLATFORM, SHOWING TROLLEY RAILS SUSPENDED OVER THE RAILROAD TRACK



LOW-PRESSURE CURTIS STEAM TURBINE INSTALLED IN THE POWER PLANT OF THE BETTENDORF AXLE CO.

Before putting the turbine in service it was run for a few days under various loads, the generator being loaded on a water box. It was found that sufficient exhaust steam was available to furnish 425 kilowatts continuously, and as much as 575 kilowatts for short periods. Six boilers of about 120 horsepower each were in service at that time. The results of the test would indicate that 75 to 80 per cent of the energy delivered to the engines and auxiliaries was recovered.

The governing of the turbine is very good, as with a load fluctuation of about 500 amperes the variation in potential does not exceed two or three volts. The lighting load consists of enclosed arc, flame arc, mercury vapor and incandescent lamps, all of which show up very much better when operated by the turbine than when the engine-driven units carry the load. This improved performance is owing to the better regulation of the turbine.

In operating the turbine, a practice is made of drawing a few buckets of oil from the tank every two weeks and adding the same amount of fresh oil; this seems to keep the oil in good condition. No trouble has been experienced in keeping the bearings cool, this being accomplished by means of circulating water. To maintain a uniform flow, the water is taken direct from the mains and passed through a reducing valve which takes care of any fluctuation in pressure in the main supply. The emergency governor is tested regularly once a week; it has never failed to respond to increase in speed, invariably tripping the stop valve on the turbine.

It is found that the attention required by a turbine generator of the size here installed is not as much as that demanded by one of the engine-driven units. Good results are obtained without the use of a receiver generator between the units and the turbine, as the reducing valve makes up for any deficiency in the steam supply, which might be due, as previously stated, to the stoppage of one of the engines or pumps. With this arrangement a sufficient supply of steam (direct from the boilers if necessary), is always assured, thus making the installation fully as reliable as the high pressure engine or turbine, and much more economical than either of these when running non-condensing.

The longest continuous run so far made with this turbine has been five days and nights. No shut-downs, due to trouble of any kind with the turbine, have occurred since the turbine was first put in operation.

International Smelting Co. has declared the usual quarterly dividend of 2 per cent, payable March 1.

Three Presses on One Bed

For the purpose of piercing bars and other iron and steel sections of unusual length which cannot be punched advantageously in a gang piercing press, the Standard Machinery Co., Providence, R. I., has designed the tool shown in Figs. 1 and 2, which consists of one stationary and two movable presses set on the same bed. The center press is stationary and is attached to the middle of the bed. The presses on either end are fed by a square thread screw actuated by a crank and are dovetailed on the bottom of the bed. The machines slide in the dovetails, which are planed on the bed, and each of the movable presses is fitted with a gib and powerful clamping screws at the back for holding the presses in position. Adjustment for the locations of the end presses are made by taper draw keys with set screws in one end of each, which are used for forcing the key out of place when a change is to be made. As many settings as desired can be made between the center press and the center of the two end presses. The three presses are the open-side type.

The height of the table of each press from the floor is 40 inches and the overall length of the bed is 7 feet, 6 inches. The bed is set on four supports and has three slots cored in it to permit the pieces punched out to drop through to boxes or carriers underneath the table.

Underneath each of the end presses in the back of the openings in the bed is a bronze nut which fits over the square thread screw for feeding these presses right and left. The nut has a 3-inch bearing on the screw and is fitted with square threads, four to the inch, with the same thread diameter as the screw. The bed is 6 inches thick and the dovetails are 9 inches wide on the upper face. A forged crank is used for feeding the presses. Each frame has a 4-inch circular opening in the bed 7½ inches from the bottom of the gibs to the table. The key for locating the presses is made of 1¼-inch square stock and is 6 inches long. The machines can be operated singly or in unison. When operated together they are actuated by a single treadle, which connects the three individual treadles together, whereas when running singly the levers at the side of each press are used for tripping.

The overall height of this equipment is 6 feet 8 inches and each press is provided with a balance wheel, 23 x 3¼ inches, weighing 200 pounds. The stroke of each machine is 1½ inches. The width of the opening in the back of the frame is 7 inches, adjustment 1⅞ inches, and the machine operates at a speed of 100 revolutions per minute. The bolster plate of each machine is 16 x 8½ inches and each plate is 2 inches thick. Each end machine can be fed back and forth on the table while the balance wheel is running. To accomplish this a special countershaft has been devised provided with five hangers and the middle stationary press is driven from a standard type pulley having a 4-inch face, whereas the two end presses are driven from pulleys having 18-inch faces, which is the length they travel on the bed. The countershaft is also fitted with tight and loose pulleys for driving from the main line. For the work for which this machine was built, six different settings are arranged in distances of 22 inches from the center of the middle press to the center of the right and left presses, up to 43 inches from the center of the middle press to the center of the end presses. Each machine is equipped with an instantaneous roller friction clutch and the total weight of the equipment is 6,500 pounds. The weight of each press, not including the bed, is 1,100 pounds.

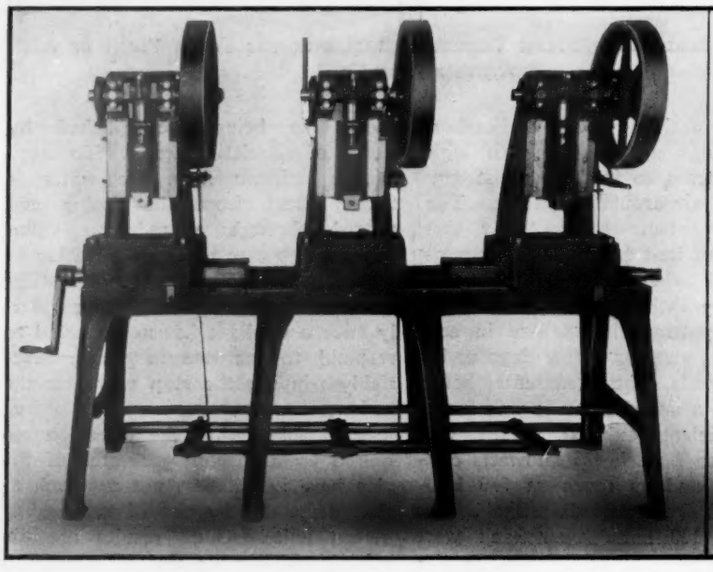


FIG. 1—FRONT VIEW OF MACHINE HAVING ONE STATIONARY AND TWO MOVABLE PRESSES ON ONE BED

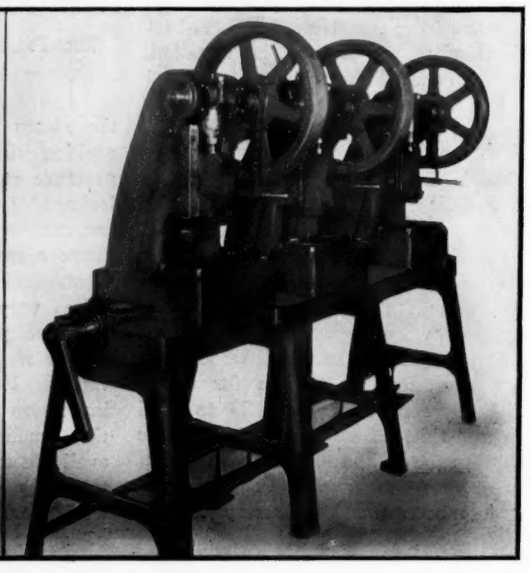


FIG. 2—ANOTHER VIEW OF MACHINE CONSISTING OF THREE PRESSES ATTACHED TO ONE BED

American Brass Co.'s Report

The annual report of the American Brass Co. for the fiscal year ended Dec. 31, 1910, shows net earnings of $1,264,581, against $1,089,584 in the previous year; and total expenditures of $1,205,937, against $1,061,958 last year, showing a surplus of $58,644, against $27,626 in 1909. Net earnings of the subsidiary companies of the American Brass Co. for 1910 reached $1,887,005, an increase of $119,459. Dividends received from subsidiary companies in 1910 amounted to $1,069,860, against $1,075,481 in 1909, while the amount paid in dividends was $900,000, as compared with the same amount in the previous year. The balance sheet of the American Brass Co., of Dec. 31, shows assets of $15,028,984, an increase of $11,039. Assets of the subsidiary companies of Dec. 31 were $22,795,345, an increase of $568,529.

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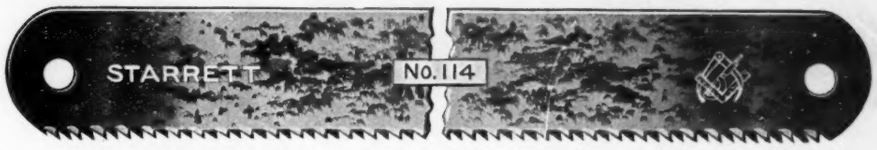

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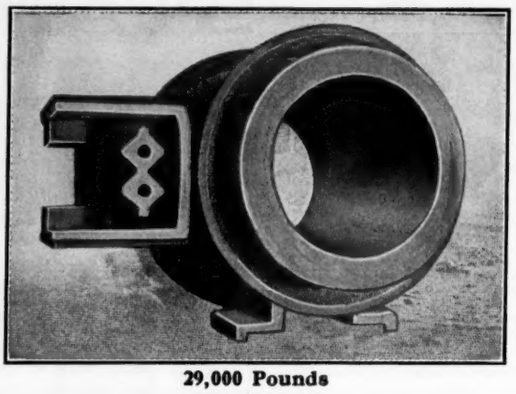

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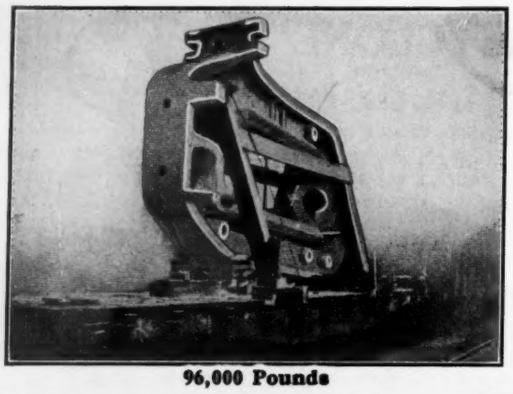

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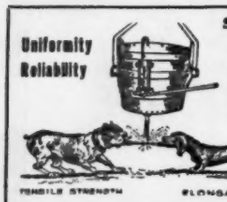

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